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A MANUAL

OF THE

DISEASES OF INDIA.

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A MANUAL

OF THE

DISEASES OF INDIA.

BY

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PREFACE.

At the commencement of my Indian service, although I had previously the advantage of observing a large amount of general practice, I felt the want of a small volume, which would afford at a glance the prominent characteristics, and hint at the most approved treatment of disease as it occurs in India. Every medical officer to whom I have spoken on the subject has confessed to have experienced the same feeling. Many have also stated their opinion that a small, concise work of the kind now offered, would be useful, not only in the initiative, but also at other periods. A numerous class, to whom it is presumed this small publication might prove beneficial, are the European and Native Hospital Assistants attached to the dif-

ferent medieal establishments, who will find therein a more eondensed, and therefore eheaper, mass of information, than is contained in any other existing work of a similar size.

It is not for one moment my intention to offer this small book as a substitute for the larger volumes of other writers. I merely intend it as an introduetion to their study, and as a means of retaining at an after period mueh of the information they eontain. Also, as a volume, unlike many others, adapted for the medieal offieer, when obliged to eeonomise space in the cabin, the tent, or the bulloek trunk.

It was my first intention to illustrate the work with small pathologieal and other sketehes, and also to give the referenee for every authority quoted; but as at an up-eountry station the faeilities of produeing the former are extremely limited, and as the latter I found added considerably to the size and expense of the book, the design was not earried out. I trust at some

future period to be permitted to fulfil at least the first idea.

Of course, a manual must be more or less compiled from other sources, and I believe, with the exception of original remarks, every item in the work is the opinion of some one well qualified to offer an opinion.

The classification of the diseases which I have attempted, appears to me preferable for a work of this kind, as showing immediately the chief exciting or predisposing cause.

W. J. M.

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INDIAN DISEASES.

PART I.

CHAPTER I.

INTRODUCTORY REMARKS.

"He who is able to distinguish what can be done, and what cannot be done, is the true physician;" but, as Sir Ranald Martin truly observes, "how great and difficult is this task!" The practitioner must measure his ways to the wants of nature, "doing neither too much nor too little, carefully avoiding what ought not to be done." This remark, so justly applicable to diseases of a temperate clime, is doubly pertinent when tropical maladies are encountered. The latter, when occurring in sthenic and newly arrived Europeans, more violent and rapid in their course, but when existing in old residents and natives, more obscure in their symptoms, and slower in their progress, imperatively demand a corresponding amount of medical energy, precaution, and vigilance. The dangerous doctrine that desperate diseases require desperate remedies must, however, be totally dismissed from the mind of the Indian practitioner. All disorders in this country are now recognised as decidedly asthenic in their tendency, and, as a rule, the anti-

phlogistically heroic practice of former days must now be regarded as worse than useless. Diseased action in the robust European, newly arrived in the country, whose vital powers are elastic, whose physical force is undiminished, and whose blood is undeteriorated, certainly manifests intense rapidity in its course, and requires a respondent promptness and activity of treatment; and it is in such cases that the leech, and the mercurial purgative, and still more rarely the lancet, are occasionally authorised; but in the older residents, whose blood is anæmic and depraved, whose strength is diminished, whose vital powers are reduced, and whose diseases are not characterised by excessive vascular action, such remedial agents are erroneous in theory, and prove unsuccessful in practice—aiding the complaint in the induction of that exhausted state to which the patient succumbs, or is convalescent only after the lapse of a tedious and protracted period. In short the physician must remain content with what can safely be effected, and with his subordinate position of nature's adjutant, not seeking to arrogate, by heroic measures, a power of cure which none possess. As Miss Nightingale observes, "It is often thought that medicine is the curative process. It is no such thing. Medicine is the surgery of functions, as surgery proper is that of limbs and organs. Neither can do anything but remove obstructions; neither can cure. Nature alone cures. Surgery removes the bullet out of the limb, which is an obstruction to cure; but nature heals the wound. So it is with medicine: the functions of any organ become obstructed; medicine, as far as we know, assists nature to remove the obstruction, but does nothing more; and, agreeing with a late witty author, 'I maintain that the administration of drugs should approach as near zero as possible.'"

With this view of the province of the medical practitioner, it is impossible to assert arbitrary rules for the treatment of disease. Principles essayed by the tests of time and experience, and valuable as the

control the sagacious physician, alone can be enforced; and although entering into details of treatment, I must urgently impress on the minds of the student, new to tropical practice, that his own judgment must eventually be the guide when intrusted with the management of ever-varying disease as it exists in India.

So much being admitted, what a responsible office does the young medical man undertake, when he arrives fresh from the schools, and, inexperienced at least in Indian practice, enters on his career in this country! He is away on detachment duty, or in charge of a ship's company, probably hundreds of miles removed from any other medical aid. Cases will occur which, at home, he would hesitate to treat without the concurrence of the second opinion there so easily obtainable. On his foresight will often depend the welfare of the soldiers or sailors committed to his charge, and to him alone, under God, have they to look when stricken with the fearful diseases of the tropics. Nay—

> "Triumphant leaders, at an army's head,
> Hemm'd round with glory,"

in common with the private soldiers, are equally dependent on the skill and ability of the medical officer, when afflicted by the prevalent diseases of this country—fever, dysentery, inflamed liver, sun-stroke, cholera, or bodily injuries, than which a more formidable list cannot be specified, should the whole legion of human ailments be called in comparison.

Sir James McGrigor long since asserted that only those who have studied the same disease in various opposite climates can fully understand the absurdity and fallacy of the supposition that the practitioner of one clime can safely prescribe for the diseases of another. The new "Army Medical School," with its hygienic and sanatory teaching, officered by some of the many experienced physicians and surgeons who have served in the Indian army, or

elsewhere, will doubtless effect much towards fitting the coming men for their future duties; but even after this most judicious course of supplementary instruction, much will remain to be acquired, which local experience will alone supply. This forms a very strong argument against the contemplated abolishment of a special Indian medical service; for, as Dr. Chevers so truly writes, "The ablest surgeon, if inexperienced in the treatment of tropical diseases, is liable to feel embarrassed, and often despondent, on his first encounter with the rapidly destructive maladies which he meets with here."*

This variation between the characteristics and type of the diseases of temperate and tropical climates being an acknowledged fact, the question of "cause" may be readily and truly answered, by referring it to the noxious influences of the latter.

The vast empire of India, situated under a tropical or semi-tropical sun, extending from the equator to the eternal snows of the Himmaleh Mountains, a great portion being uncultivated or irreclaimable land, containing numerous mountain ranges, and bounded by the ocean on two thirds of its circumference, must of necessity present an almost endless variety of climate.

Although it cannot be doubted that the salubrity of the air depends in different places, in a great measure, on the condition of the surface of the earth at those places, still much depends, particularly in the tropics and in semi-tropical countries, on the state of localities far away. The truth of this is evidenced by the occasional baneful effects of the land winds, by the noxiousness of the "samiel" of Arabia and the Persian Gulf, by the chilling north-east winds of the cold season in Calcutta, by the injuriousness of the siroccos of the Mediterranean, by the fever-laden blasts from the Pontine marshes, by the simoon of the semi-tropical regions of Asia, and by the fever-laden blasts from the Runn of Kutch, all of

* Dr. Chevers, "On the Means of Preserving the Health of European Soldiers in India," 'Ind. An. Med. Sci.,' No. X.

which, charged with mephitic exhalations, bring discomfort with them, and leave disease in their track.

> "All the infections that the sun sucks up
> From bogs, fens, flats
> Are scatter'd broadcast by them as they sweep along."

Therefore, before the salubrity of any given place can be decided on, we must take into consideration those very numerous accessories, the result of which medical science expresses in two words—good or bad climate. We cannot, in our advanced state, confine the definition of the last word to the condition of local water and air (آب وهوا), as the natives of this country are wont to do; but must take an exceedingly more comprehensive view, and consider the combined influences of latitude; relative position of sea and land; elevation above the level of the ocean; prevalence, or absence, of mountain ranges; geological nature of the soil; average amount of dry and wet season during the year; average fall of rain, and direction of winds; the humidity; the position of sterile sand-tracks, of extensive lakes, of marshes, and of rivers and their embouchures; these inducing, by their varied influences, the natural physical climate of a district.

Medicine is not, however, satisfied even with this extensive range of subjects. She has allied herself with her younger sisters, hygiène and sanatory science, and hence climates are made in localities where previously the deadly influences of one or more of the above causes proved inimical to human life.

Hence medical climate is not completely described without we also add local aspect, cultivation, the presence or absence of trees, position and condition of buildings, drainage, and, in short, all the labours of man, as circumstances to be taken into consideration when attempting the delineation of climate, as it affects health and disease.

Thus, as Dr. Haviland observes, "In studying climate we must study man; for in tracing its effects in all their variety on the human frame, we make ourselves

acquainted with his laws, customs, psychical and physical capabilities, vices, virtues, and all that pertains to that protean animal."

Sir James Annesly long since remarked, that there is no country in the world where there are greater vicissitudes of climate than in India; and a work on that of this country would be the occupation of years, and in fact never could be performed by the unaided observation of one individual. It is therefore quite impossible, in a work of this scope, to do more than intimate the chief peculiarities and their modifications by collateral circumstances or natural obstacles; which indeed not only alter the climates of particular localities, but, as will presently be exemplified, modify that of whole districts by their peculiar position.

The three great divisions of the year into hot, cold, and rain season is found to be more or less permissable throughout the whole territory; although in Scinde, the Punjaub, and the northern parts of Hindustan generally, the rains are less violent, the cold is more intense, and the heat quite as fervent. In southern and peninsular India, where these changes are governed by the monsoons, the alternations of dry and wet are pretty regular, although somewhat varying in different localities as to period of the year. Thus, on the Malabar coast the south-west monsoon commences about the middle of April, and continues till August or September, when it gradually loses its violence; towards the end of October, the north-east monsoon begins on this coast, blowing like the opposite winds, first on the southern part, and not being felt to the north for about a fortnight after. On the Coromandel coast, the south-west monsoon commences in April, but does not blow violently till June, declining in September; the north-east commencing about the middle of October.

On both coasts the setting in of the monsoon is generally accompanied with violent storms, most so, however, on the Malabar coast, which is deluged with rain during the south-west winds, in consequence of the clouds which are brought by these blasts being in-

tercepted by the lofty ridges of the western ghauts or mountains; thus producing a striking example of the manner in which natural obstacles modify the climates of whole districts. Owing also to the same circumstances, it is the dry season on the Coromandel coast; but at the northern termination of the western ghauts, the monsoon, as far as it blows (about lat. 24° 44′), carries the rain without intermission over the whole country; again forcibly illustrating the difference of climate arising from natural obstructions. The rains, however, on this coast are not so violent as on the Malabar; and this seems to be accounted for by the circumstance that the eastern ghauts are less elevated, also further from the sea, than the western, thus intercepting and collecting a smaller proportion of clouds and vapour. From such causes the Carnatic has only about two months' rain, while in the Circars the wet season lasts much longer; but the province of Coimbetoor partakes of the wet season of the Malabar coast, this again being occasioned by a lowness or break in the ghauts in that locality.

Thus, if the *general climates* are given by latitude, that is, by the relation of the surface of the earth to the sun, the *special climates*, characterised by the unequal distribution of the temperature and rain, are the effects of the grouping of continents and high lands; *particular climates* again being caused by the sanatory condition of a given locality.

It has already been stated that the monsoons do not extend beyond lat. 24° 44′, and therefore the northern parts of Hindustan have the dryest climate. During the months of July, Augnst, and the early part of September—the rainy season in the southern part of India—the atmosphere is generally clouded, but very little rain, comparatively speaking, falls. Indeed, in Scinde there is very little during the whole year, which, together with the proximity of sandy deserts as heated and arid as those of Arabia, renders the temperature of this province excessively high, the thermometer in June and July varying from 90° to 100°. The cold

season, on the other hand, is marked by very low temperature; in the northern part falling below 30°, and water freezing in tents. This great variation of heat and cold is experienced in Rajpootana, in the Delhi district, and in the Oude country, and even so low down as Benares and Allahabad.

North of all these districts are the provinces of Cashmere, Gurwal, Cabul, and Nepaul, above which tower the lofty heights of the Himmalehs, presenting numerous localities for sanitary stations, for refuges for European children, and, perhaps, colonization, where the native of colder climes may enjoy "the delights of a lengthened spring, the regions of a real winter, and the genial heat of a healthy summer."

At Calcutta, during the month of April, the thermometer rises as high as 110°, and rarely falls below 72°; while in December, with a north-east wind, it sinks as low as 52°. At Madras, taking the average of the year, the heat is less than at Calcutta, the mean height being 80°, seldom rising above 91° in July, and in January, when lowest, about 75°. At Bombay, it ranges during the year from 64° to 98° or 100°.

The soil of India, as might be expected in so great a tract of country, presents many varieties. In the plains through which the Ganges runs, it is a rich black alluvial mould. In other parts of Bengal there is a considerable extent of clay. The soil of the Punjaub somewhat resembles that of Bengal, as is also the case in the Mysore districts. Towards Guzerat, Scinde, and Rajpootana, it becomes sandy. On the table-land of the Deccan and the southern provinces the soil is of various qualities, but in general loam or rock. Near the coast, it becomes sandy. In the province of Malabar, at the foot of the low hills or spurs of the ghauts, it is a reddish clay. On the Coromandel coast the sandy soil continues to the foot of the eastern ghauts, which are of granite, and present a frightful barrenness. The west ghauts contain much limestone and basaltic rock. Rocks of trap formation, sandstone,

and quartz, are found in Malwah. The substratum of the soil in many parts of Hindustan proper is calcareous, in others clay or rock.

Near the mouths and banks of rivers, and in most places where irrigation can be effected, India presents a very fertile aspect, rich crops being everywhere visible. In the dry season, indeed, and in those immense tracts of country where water is not procurable in an easy manner, nature seems to languish; but two or three days' rain will transform a seemingly barren plain into a verdant pasture; and it is during this season that the vegetable kingdom is exhibited in all its glory.

Such is a cursory view of the Indian climate, but it cannot be accepted as anything more than a most imperfect generalization. Every district, from the neighbouring mountains, sea-coasts and sand tracts, has been found to possess a different climate, which, when we take into consideration the influence of soil, cultivation, water, jungle, and position, must certainly be more varied than at first would be supposed, and, consequently, more or less inimical to the constitution of the European who sojourns in the different localities.

For a long time many European governments, somewhat in accordance with medical theories, hoped that by a protracted residence in hot climates the foreign garrisons would diminish their ratio of mortality, but the practical application of this theory was followed, as is demonstrated by M. Boudin,* by the most disastrous results. Now, however—

"Scientiæ mutantur et nos mutamur in illis;"

and it is becoming a generally admitted fact, that in India there is no such thing as climatization. As a rule, the European seems to enjoy the best health during the first months or years of his residence in the eastern tropics. Here there is no "seasoning

* 'Traité de Géographie et de Statis. Méd.,' vol. i, p. 60.

disease," but the system suffers from the lengthened application of the climate. The individual becomes enervated, his strength exhausted, the blood anæmic; in short, the *vis vitæ* declines, and the cachectic diathesis thus established renders the constitution an easy prey to the endemic diseases of the country, on the least exposure to malarious influence.

This condition is not so quickly developed in some constitutions as in others. Vigorous, robust, and hale Europeans, are undoubtedly seen who have been long resident in India; but ask these men of the jovial companions of their younger days, and we shall learn how few survive. They themselves are but exceptions to the general rule—not, however, so striking as at first sight appears; for if we watch these old Anglo-Indians, we find many a one becomes the victim of "one year longer in the country."

Moreover, visit any of the European graveyards near the various military stations, and the observer cannot fail to notice the number of *young* men whose ages are recorded on the tombstones—

"An unripe harvest for the scythe of death."

Nay, take the history of any English regiment, and we find, after twelve years passed even in peaceful cantonments, very few of the men remaining who composed the battalion at the commencement of that period. As a late writer forcibly remarks, "At recent periods, European regiments in India have melted away like the spectres of a dream. A thousand strong men formed this year a regiment; a year passed away, and 125 new recruits were required to fill up the broken column; eight years passed away, and not a man of the original thousand remained in that dissolving corps.'*

Not much wonder that the recollection of such facts should still throw a gloom over Indian adven-

* "The British Juggernaut in India," 'Sanitary Review,' October, 1857.

turers. Well might Sir Ranald Martin write, "Disease is the greatest enemy of the British soldier." And what is the reason of this mortality? Let the same author answer, "The climate unstudied; the man unprotected." Until the deleterious effects of the former are fully appreciated by all classes of officers—until *general* sanatory regulations are carried out to the letter in all cantonments, as government in different orders on the subject intend that they should be—until every man who can be spared by military necessities from duty on the plains is housed on a hill station—and, above all, until the evil effects of intemperance, combined with a malarious climate, are periodically demonstrated to the men in plain and unmistakable terms, the utmost protection cannot be said to have been afforded. The sanatory lectures which military surgeons have been latterly requested to give to the men under their charge, by that eminent soldier and promoter of education, Sir W. Mansfield, may, I think, be made productive of the greatest benefit.

Doubtless, much has been effected during the past few years towards ameliorating the condition of the European soldier in India. Undoubtedly much remains to be done; and certainly there is no lack of ardent, hopeful officers, both medical and military, who have the welfare of the soldier at heart. Government, also, never refuses to listen to rational suggestions and propositions; but, paradoxical as it may appear, the want of "the root of all evil," paralyses the executive in designs of a sanitary and hygienic nature. In "the good time coming," when India shall have recovered from her late and present trials of war and famine, there can be little doubt that those means of preserving the health of European soldiers in India which have been set forth by others, and which are faintly shadowed in the following chapters of this book, will be effectually carried out.

The more immediate changes evinced in the system of the newly arrived European are those affecting the

function of the skin and liver—the cutaneo-hepatic sympathy of Dr. Johnstone. Without bringing forward any novel or supporting any old theory, it may be stated that a vicarious decarbonization of the blood seems to be established by increased action of the liver, as evidenced by the large quantities of bilious material passed by most new arrivals in India. As this can only be accomplished by an increased flow of blood, and consequently hepatic congestion, how cautious should each one be during the first months of residence in this country; and yet how few, most from ignorance on the point, attend at all to the subject!

The European arrived in India pursues the same course of living he did at home; even in the upper classes of society, he often exceeds his customary style; and what with the novelty and excitement, the heat and dust, and probably the invitations of hospitable friends, he takes a greater amount of carbonaceous material, in the shape of ale, wine, and three meals per diem, than he ever did in the colder and denser atmosphere of his native England.

If this be the case with the upper classes, how much more is it true with regard to those lower in the social scale, as private soldiers and sailors. Many of the former have perhaps been taken from a state of street destitution, from the meagre fare of the agricultural labourer, or from the oftentimes worse condition of the factory *employé*. These men are confined and fed well on board ship for some months, then landed in India, perhaps in the hot season, when they immediately join a mess much richer in the elements of carbon than what they were accustomed to partake of under colder skies. The system being thus loaded, one of three things must happen; either the individual suffers from a succession of painful boils, or bilious diarrhœa comes to his relief, or the liver grows congested, and requires the medical treatment appropriate for that particular condition.

Probably, also, the "prickly heat" which so many

suffer from on first arriving in India is another manifestation of this overcharged system, and not wholly due to the increased excitation of the cutaneous surface.

It is evident from the anatomy of the portal circulation, that any congestion of the liver must tend to retard the flow of blood through the capillaries of the intestines. Hence, in addition to bilious diarrhœa, we frequently have congestive or inflammatory diarrhœa as a result; and this, with the additional excitation from acrid bile, is very liable to pass into true dysentery. Moreover, the congested state of the liver, being neglected, may give rise to the insidious form of suppuration in that organ, may pass into acute inflammation, or terminate in the formation of organizable matter, inducing temporary increase of size, and eventually cirrhosis, only to be fully developed by its results months or probably years afterwards. It is true a very large number escape these more serious evils, but nevertheless all are liable; and therefore abstinence from spirituous liquors, and moderation in diet, cannot be too strongly insisted on, especially during the first few months of residence. During this period, a young, healthy individual, particularly if inclined to plethoric habit, will do well by abstaining from all stimulants, and adopting a dietary principally composed of vegetable material; for if the effects of alcohol or spirit-drinking, or of the habitual indulgence in hot spiced dishes, be added to the excitement of the portal system induced by the change of climate, I feel justified in asserting that such changes in the minute structure of the liver will thereby be induced, which, as a rule, will eventually destroy the health, happiness, and even life of the patient. After a short residence, however, total abstinence is not to be recommended; the latter extreme, then, appears only less detrimental than excess, inducing as it will in many instances depression and irritability, and consequently aiding the mephitic atmosphere in the development of anæmia

and cachexia, and thus rendering the system still more liable to the endemic malarious diseases of the country.

The great feature of all disease in India is its well-known tendency to assume an intermittent type, and this fact must not be lost sight of when called upon to prescribe. Many, indeed, most of the severe inflammatory or congestive affections are complications arising during the course of intermittent or remittent fever, or in constitutions already debilitated by their occurrence, and thus are to be looked upon as local determinations the consequence of the febrile action. To cure the congestive complaint it is first necessary to remove the exciting cause, and hence the administration of Quina, Arsenic, and other anti-periodics is not only allowable, but imperatively demanded during the acute state of congestion, or even inflammatory action. Moreover, this class of medicines not being in small doses, at least stimulating tonics may be administered without fear of increasing local congestion, unless the head be the part so affected when Quinine is used, or the bowels when Arsenic is given. The former, in large doses, produces tension and pulsation in the head, frequent pulse, excitement, sometimes even delirium and convulsions, in short, cerebral congestion; the latter, in any amount, will most probably cause burning of epigastrium, vomiting, and purging, abdominal congestion; and therefore any quantity exceeding a very moderate dose of these two remedies is strongly contra-indicated in the respective conditions noted. Still, however, their employment in small doses, when such complications are present, is correct practice; for, as Dr. Bence Jones states, Quinine and Arsenic so administered have a direct sedative effect on the circulation, causing a diminution both of the force and frequency of the pulse, and thus inducing their good effects by blunting the sensibility of the sympathetic nervous system, rather than by adding to the *vis vitæ* by stimulation.

It has been shown that the effect of a prolonged residence in the tropics is a gradual deterioration of the strength and energy; and it will readily be imagined that the great difference existing between the hot, cold, and wet seasons, in temperature, moisture, dryness, and electrical condition of the atmosphere, must induce a corresponding change in the system of the European resident, and in the diseases to which he is subject. And such, indeed, is found to be the case. The hot season is the most healthy of the three. Here, although the heat is great, and sufficiently uncomfortable to bear, it is at least equable, and the body is not so liable to sudden impressions from damp, chills, and cold winds as it is at other times; neither are malarious exhalations so abundant. The old residents in India, in whom the functions of the skin are more or less exhausted, seem to enjoy greater sensations of health at this period; the increased excitation of the surface, consequent on the continued higher range of temperature, causing an exudation of moisture which relieves the disagreeable dryness and roughness experienced when the warmth is not sufficiently great to stimulate the exhausted skin to renewed action. Epidemics, however, of cholera especially, and of heat-asphyxia in crowded and unventilated barracks and hospitals, and eruptive diseases generally, are often present during these months; and the debility engendered by long-continued and distressing heat renders the termination of the season in that of rain and moisture fraught with danger, and a critical period to all.

The sudden changes of temperature which occur, consequent on the violent fall of rain and the excessive moisture of the atmosphere, tends to check the before superabundant perspiration, and altogether prevents the evaporation of moisture which is still copiously exuded by the cutaneous surface. The blood is thus, probably, rendered more dense, and an aptitude to congestive forms of disease engendered.

Accordingly, the maladies of Europeans at this season assume a diminished character of vital action; affections of the abdominal organs, diarrhœa, and dysentery are more frequent; and as the season advances, and the saturated soil begins to dry, malaria is more abundant; and consequently remittent and intermittent fevers are very prevalent. Abortions also are more frequent at this season, and ulcers and sores of all kinds generally more difficult to heal.

The cold season, although it cannot be considered, statistically speaking, as the most healthy, is certainly the more enjoyable period, and particularly so for those latterly arrived in the country, or for those in a sound and healthy condition. To the delicate and sickly, however, to those of languid circulation, and to many old Anglo-Indians, this period is, at the least, fraught with discomfort and annoyance. The long resident, and the feeble, experience a sense of dryness of the surface, burning of the palms, and general irritability, for which many would gladly exchange the more pleasing sensations derived from a greater degree of heat. The diseases occurring at this season are chiefly fevers of the intermittent type, and the complications which occur are often of a congestive or sub-acute character. The functions of the liver are also often depressed; a sense of weight and uneasiness, frequently relieved by exercise, may be felt in the right hypochondrium; and the alvine evacuations are clay-coloured, variegated, or unnaturally dark. Chest affections, coughs, and colds are also more frequent than at any other time. The kidneys, however, act with greater vigour, and large quantities of limpid urine are frequently secreted.

From what has been advanced it must be clear that, in addition to age, idiosyncracy, temperament, sex, habit of body, &c., the length of residence in India must be duly considered when about to prescribe for disease occurring in a European. It has been stated that a constant deterioration of the system goes on from the time the white man first commences his

Indian life. Gradually and in various degrees, according to the original strength of constitution, amount of solar or night exposure, and consequent on the latter greater action of malaria, the cachectic condition becomes established, and this perhaps independent of, or, as more often happens, aided by attacks of remittent or intermittent fever. As a result of this debilitated state, a low insidious form of inflammatory action is observed, which, from its very marked nature, is not the less dangerous than the acute. In this character of disease, while energy of treatment is imperatively demanded, depletory measures cannot be used to that extent which in the latter form is sometimes so desirable.

From the earliest ages down to the present time, the propriety or otherwise of blood-letting has been the subject of most unsatisfactory and conflicting conclusions. For instance, Pythagoras (B.C. 580) disapproved of bleeding, and Hippocrates (B.C. 420) speaks of having practised it successfully on his patient Anaxion for pleurisy. The disciples of the latter teacher, Diocles and Proxagoras (B.C. 340), also used venesection; while Chrysippus and Cleophantes denounced the practice. Celsus (A.D. 10) bled children, old men, and pregnant women; while Galen (A.D. 131) takes the precaution to give a list of diseases in which venesection should never be employed.

In later times we have Sydenham stating, "Primum in curatione phlebotomiæ attribuo;" and the author of 'Medicina Vindicata' (A.D. 1725), and Henry Stubbe, M.D., defending the practice against the attacks of one G. Thomson, who most sagaciously writes, "They should never attempt—yea, rather abhor—to enervate in the least by the lancet the strength, with its correlative blood and spirits, without which there is no hope of cure."

Thus it is very evident that the doubt as to the propriety of blood-letting did not originate with the present generation, although, indeed, the credit (if it can be so designated) of bringing forward the in-

genious theory, that a change in the type of disease has brought about the present decided inclination to a non-depletory practice, attaches to men of the present day.

An attentive perusal, however, of the detailed cases in Annesley's large work, and in the older records of Indian practice, and a comparison of such cases with those occurring at the present period, does not bear out the theory of a changed type of disease, as it occurs in this country, such as Drs. Allison, Christison, and their supporters would have us believe.

Neither do I consider any such apology necessary to justify the present non-bleeding system—a revolution of practice not depending, as I believe, on any change in the characteristics of disease, or deterioration of *physique*, but on a juster appreciation of the province of the medical practitioner, of the curative powers of nature, and of the importance of husbanding a patient's strength, instead of allowing it to issue from the punctured orifice of the median cephalic or basilic vein.

Blood-letting, either general or local, is one of the most powerful agents we possess, and, in India, is occasionally essential for the cure of disease occurring in constitutions where the cachetic taint is not marked. It is in such cases, as Robert Jackson stated, "the main engine of successful practice;" but in most conditions it can only be regarded as an auxiliary, and only to be used after mature consideration of the symptoms presented; and often such scrutiny will determine the measure as inadmissable.

From these remarks, however, I do not wish to be understood as belonging to the class of practitioners who, under the mistaken idea that the red particles, being reduced beyond a certain amount, cannot be replaced, never have recourse to depletion. On the contrary, my memory is stored with numerous instances of pneumonic, pleuritic, and other inflammatory affections occurring during my initiative in a large country

praetiee at home, where the efficacy of the lancet was so clearly demonstrated, that I have ever since, in a eertain elass of cases, held an opinion with regard to bleeding little inferior to the conviction previously quoted, as expressed by Robert Jackson.

Moreover, I eould also refer to numerous instanees in the writings of both aneient and modern authors of immense losses of blood having oecurred without any permanent ill effeet. Cases of this kind are on reeord by Schenck, by Brassavolus, by Mareellus Donatus, by Riolau, by Ashton, and must be familiar to every operating surgeon; and, also, I can point out numerous individuals who have been bled "at the rise and fall of the year," during the best half of their lives, and who now, in their declining age, are hale and hearty. Although, of course, not recommending this Sangradism formerly so prevalent in the country districts of England, still the fact may be mentioned as indisputably proving that, in certain constitutions, blood-letting, even when eopious and repeated, leaves no permanent ill effeet.

With every desire to husband the strength, and with the knowledge that most diseases have an asthenic tendency, cases of acute disease will occur, and progress so rapidly in vigorous and asthenic constitutions, both in this eountry and at home, that bleeding, by its quick and effeetual relief of eongestion, is the only path to convalescence. This, however, can only be required in Indian practice in the inflammatory diseases of robust, well-oxygenated, or newly arrived Europeans, and these form a very small proportion of the cases which eome under the care of the generality of Indian practitioners. Hence, the latter may be long strangers to the lancet; but it must be ever borne in mind, that this instrument may, at any time, be required to relieve that congestion which, otherwise, would terminate in deep-seated and deadly suppuration. It must, however, be urgently represented, that there is no remedy requiring more discrimination in its application; and al-

though so desirable in the class of cases I have pointed out, it is as positively contra-indicated for the long resident, the debilitated, the anæmic, and exhausted.

Between the extremes of debility and vigour there are certainly conditions sufficiently perplexing to render the question of the advisability of bloodletting one of extreme difficulty. In by far the most cases, avoiding general, we must be content with local depletion; and, in very many others, we are obliged to trust to other means in our management of disease as it exists in India.

Clutterbuck felt this difficulty so strongly, that he not very logically comes to the conclusion that bleeding is useful when it is useful, and hurtful when it is hurtful. Somewhat like a certain Justice Shallow, who, in his summing up in a doubtful case, consoled himself by remarking, "If I'm right, I'm right; and if I'm wrong, I'm wrong!"

We have now, however, reached a period of increased knowledge in the art of diagnosis; every day adds to our acquaintance with the true causes of disease; routine is now no longer allowed triumphant sway; and the scientific physician will use, but not abuse, the powerful agent under consideration; erring, indeed, in cases susceptible of grave doubts, on the non-depleting system, and scarcely admitting, with reference to the lancet the truth of the old adage, *In medio tutissimus.*

Dr. Brown-Séquard,* in his admirable lectures on paralysis, remarks, "No agent has been more extensively and blindly used than mercury;" and this assertion, as regards the administration of the mineral in India, is doubly correct. In former days its exhibition was carried to unauthorised excess; and even now practitioners are to be found who, having more faith in its efficacy than in that of any other medicine, prescribe it to a corresponding extent. Nearly, indeed, every author on Indian diseases has recommended

* 'Lancet,' Nov. 8th, 1860.

calomel, either for its so-called sedative action, or for the benefit supposed to be obtained from its specific effect; all have spoken more or less enthusiastically in its favour; and by some, indeed, it has been lauded as a panacea, *omnibus semper et ubique*. Now, however, *scientiæ mutantur*, and the routine use of mercury, like duelling and other relics of barbarism, is daily becoming less and less common; and I have yet to learn that the treatment of disease in India is less successful than in years gone by. The rude empirical practice of the routine exhibition of mercury has now, let us hope, for ever passed away; for there is reason to believe that its habitual administration to the languid and weak, equally with the strong and robust, has destroyed many who, under (then) less popular methods of treatment, would have recovered in due course; the disease, as Dr. Habershon* observes, being "smothered out by mercury, unfortunately, also frequently extinguishing the patient."

That there are cases where its purgative and emulgent action is requisite cannot be doubted; that there are a less number of both acute and chronic inflammatory diseases where its moderate specific action is accompanied by amelioration of symptoms is equally a fact; but it does not necessarily counteract inflammation, as all must admit who have seen pericarditis, inflammation of the meninges, or peritonitis terminate fatally, although mercurial saliva was copiously flowing from the mouth.

Throughout this work it will be a constant endeavour to avoid routine recommendations, or the suggestion of any remedy or method of treatment simply because the disease may be called by a specific name. Even the most accomplished and acute physicians cannot avoid some amount of empiricism, as for instance, in the exhibition of quinine; but still it should be the aim of every practitioner to suit his prescriptions to special circumstances, and to avoid that

* 'On the Injurious Effects of Mercury,' p. 22.

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stereotyped system so much in vogue among our recent predecessors, which induced a late eminent metropolitan physician to use printed prescriptions, to which, when prescribing for his patients, he merely attached his initials.

In very many diseases I hold the exhibition of mercury to be inadmissable; to very many constitutions it is nothing less than a poison. In the scrofulous habit, in most forms of chronic liver disease, in chronic affections of the spleen, in cholera, and in all cachectic conditions, I should rarely prescribe it; and even in acute hepatitis I consider that a very small amount only is desirable. For further observations on the use of calomel, I beg to refer to the article on the last-mentioned disease.

The use of purgatives has also been much lauded as adjuvants in the treatment of many Indian diseases. That they are sometimes required, and when so demanded productive of much benefit, cannot for one moment be questioned; but as intestinal affections are so prevalent in the tropics, this class of medicines cannot be used with Hamiltonian freedom, without greater risk than is the case in colder climes, where abdominal determination does not so frequently persist. When purgatives are necessary, they should be accompanied by some carminative agent; and drastic cathartics should not be employed at all, there seldom existing any real indication for their exhibition.

This caution against the induction of powerful expurgation applies also with great force to medical practice among the natives, who (particularly those of Southern India) differ considerably in constitution from their European conquerors. They have not the same *vis vitæ* and physical power; their muscular system is more lax, and their venous possesses less tone. They are also more liable to diseases of the congestive than the inflammatory type, thus approximating nearer to the condition of the European who has become debilitated by malarious cachexia and

long residence in the country. Moreover, it must be recollected that the mode of living of most natives, their vegetable diet, their avoidance of the use of fermented drinks, and in many instances the abundant consumption of opium and other intoxicating agents, all combine with the generally malarious atmosphere to render them unable to bear purgatives, or, in fact, depletory measures of any kind, beyond a very limited extent.

The stimulating treatment, a revival, or rather, exaggeration of the Brunonian system of the last century, has gained considerable ground in India, and will probably be more extensively adopted in consequence of Dr. Todd's late publication. Stimulants are certainly very frequently required in Indian practice, but scarcely ever to the extent which has been found useful at home. As a late circular issued by the director-general of the Bombay army (with reference to the large amount of wine and spirit expended in European hospitals) expresses, the well-fed European soldier in India does not, as a rule, require that stimulation which the anæmic inhabitants of large towns at home are found to do.

The natives of this country have a homely proverb, borrowed, I believe, from the Persian, to the effect that "the proper devil of mankind is man;" and, in concluding these remarks, I must state that health in India depends much on the control which each maintains over the enemy within. Temperance both in quality and quantity of food and drink, as much physical exercise taken in the cool of the day as the season will admit, occupation of the mind by a judicious mixture of pleasure and business, avoiding as much as possible exposure to the sun and night air, guarding against depressing passions, among which anger may be considered a chief, the use of suitable flannel clothing, particularly a belt over the bowels in the wet season, and the application of proper remedies at the very first onset of disease, will enable the European to sojourn in India with the greatest amount of

happiness and serenity. Such, with the Almighty's blessing, will preserve that health which is

"More worth than kingdoms, far more precious,"

and enable him to spend the evening of his days with comparative comfort in his father-land at home; a hope never absent from the heart of the Englishman exiled in these burning regions. He, as it will be attempted briefly to demonstrate, will never colonise Hindustan, as he has done other countries blessed with a climate something resembling his own Britain, in which his children may retain their strength of body and vigour of intellect undegenerated, without the sword of Damocles, in the form of disease, ever threatening to cut short their earthly career.

CHAPTER II.

ON THE MEANS OF PRESERVING THE HEALTH OF EUROPEANS IN INDIA.

The safety of "our Indian empire" depending on the British army of occupation, and the health of that army depending on sanatory science and medical hygiène, it follows as a necessary consequence that the economical possession of India rests to a very considerable extent on the latter; for "what is the sword without the strong arm?"

When we are told from indisputable data* that the mortality of the European soldier in Bengal is 633 per 10,000 per annum, at the soldiers' ages, and in the London Fire Brigade it is only 70, it is not too much to say that inquiries into the causes, and suggestions for the remedy, of this excessive mortality

* Guy, 'On the Mortality of the British Army.'

are tasks worthy the acceptance of the medical officer.

When calculation is made of the enormous expenditure caused to the state by the untimely deaths of men made soldiers with so much care, and transported at such great expense to this country, each individual private being then worth some £100, the same tasks appear to be worthy not only the attention of the physician, but also to demand the close scrutiny of the political economist, the statesman, and the tax-paying public of both Great Britain and India.

It is, however, for the medical man that this subject has the greatest interest; for he only can trace the slow and insidious causes of disease from their origin to their desolating and destroying ultimate; he only can sorrow over the apathy, neglect, or unbelief with which many to him "household facts," relative to the origin of disease, have been frequently treated; and he only can fully appreciate the satisfaction arising when, by the establishment of any hygienic law, the power of arresting disease is exerted, and substituted for the more uncertain business of treating it when developed.

The satire of Horace, "Quod medicorum est promittunt medici," "physicians only toast the healing art," is now no longer applicable to our profession. "These times want other aids;" and, acknowledging the medical officer as specially qualified by his education to afford such aids, the new army medical regulations have been judiciously framed so as to give him a recommendatory power as regards sanatory matters, which cannot now be so "inconsiderately rejected," as the same might have been prior to 1859.

The causes of the great mortality among Europeans and British soldiers, especially in India, is to be found under the following heads:

1st. The improper selection of recruits, and the mode of despatch, and period of arrival in the country.

2nd. Intemperance.

3rd. The malarious climate and heat.

4th. The exposure consequent on a soldier's duty both during war and peace.

So much has been written regarding the proper selection of recruits, that little more than an enumeration of the prominent requisites will be attempted. Too young men have always been unable to endure the trials of active military duties, serving, as Napoleon stated, to encumber the hospital and roadside. Ballingall, Marshall, M'Grigor, Mouatt, have written strongly against too young men being sent on foreign service; but, of course, many individuals having been strangers, "from their youth upwards," to the "*res angustæ domi*," or from other inherent causes, are better nourished, stronger, and more capable of sustaining fatigue at seventeen than others at twenty or upwards; and, therefore, much must be left to the discretion of the examining officer.

There are, however, numerous individuals who, possessing a naturally feeble constitution, will never sustain, for any lengthened period, the exposures consequent on a soldier's employment in India; although they might perform the same duties in a climate less malarious, heated, and debilitating, both with ease to themselves and with advantage to the state. The same persons might also live in India, and enjoy comparatively robust health, if placed under different circumstances to those surrounding the European soldier. If able to command horse exercise, the disposal of their own time, their diet, avoidance of midday exposure or night duty—in short, if able to make health a study, such might remain long in the country without more than an average chance of experiencing acute attacks of disease, or of gradually declining into that cachectic condition afterwards to be described.

It is very difficult to give rules by which this class of individuals may be readily distinguished, although immediately recognised by the experienced eye. Those, however, in whom cachexia has already ad-

vanced, in whom the scrofulous diathesis (if not congenital) has been created by any circumstances capable, directly or indirectly, of lowering the vital energies, by poverty and wretchedness, meagre and insufficient food, neglect of exercise, insufficient clothing, neglect of cleanliness, habitual exposure to damp and cold, or by want of fresh air and solar light, should be unhesitatingly rejected for Indian service. Hence, those nearly approaching the phlegmatic or lymphatic and melancholic temperaments, in whom, *cæteris paribus*, the chest is small, the upper lip full, the form and features rounded, and the joints large, should not be sent out as recruits, or even allowed to accompany their corps on tropical service. This subject has hitherto been little studied by authors on Indian diseases; but, I believe, a due attention to the points here briefly referred to would secure many from early disease and death, and maintain numbers in an efficient condition, to the salvation of their own health, and therefore to the immense advantage of the pecuniary liabilities of the imperial treasury.

The same unanimity of opinion which exists as to the desirability of despatching only well-formed, well-grown, and mature men for tropical service is also found in the recommendations of every medical writer from Annesley downwards, that the recruit should learn his drill before embarking for India. Every surgeon who has passed any time in the tropics must endorse this opinion, and cannot but be in position to refer to numerous instances where the new-comer has deteriorated in *physique*, or even broken down, under that daily demand on his physical powers which he would have borne without undue fatigue, if undergone in his native England, instead of in the terribly debilitating climate of the tropics.

Neither can it be questioned that the proper period for the new-comer to arrive in India is at the commencement of the cold season; for, although the colder months have been spoken of as less healthy

statistically than their opposite, still, paradoxical as it may appear, the former is the time when the majority of fresh arrivals enjoy the best health; and those commencing their Indian career at such periods are more likely to become gradually inured to the heat of the climate, than others transferred from temperate zones to the intense heat of a summer tropical sun.

Those admirable notes, 'On the Despatch of Troops by Sea,' having been so lately published by Mr. Kirwan, of Her Majesty's 13th Light Infantry, it would be a work of supererogation on my part if I allotted much space to this head. I will, therefore, only state, that the transport should be kept "elegant by cleanliness;" that dry scrubbing should be frequently substituted for that eternal sousing with water, of which all nautical men appear so fond; and that the food and drink should be in limited quantity, and exercise enforced: the too general routine life of passengers, *viâ mare*, "to eat, to drink, to sleep, to eat again," being combated in every possible manner. On the passage out, let it be remembered—

"That life is only life when bless'd with health;"

and that to retain the latter—

"Nullum numen abest si sit prudentia."

Before leaving this subject, I cannot conscientiously but again refer to what I have reason to consider as the cause on board ship of much discomfort and sickness to the crew or passengers. I allude to the system in force of washing decks and interior parts as a *necessary* portion of the daily routine work. This, of course, does not become a subject of animadversion when pursued in the hot weather of tropical climates; but when the same system is continued in damp and rainy localities, or in places where the fall of dew is great, it then becomes a

source of serious ill health. The decks, being saturated with the damps of night, are deluged with sea water before they are dry; and the latter has scarcely time to evaporate, when returning night again soaks the willing wood with dew and moisture.

As a natural consequence, rheumatism becomes a common disease, perhaps not sufficient to send a man on the sick list, but, as I can say from dire experience (having served upwards of two years in the Indian navy as a medical officer), showing itself by pains and aches in all the joints, and rendering the system for long afterwards prone to diseases, among which albuminuria (which sent me to Europe for two years) cannot be considered the least.

And while on this subject I may mention another cause of disease, which my service in the navy could not but bring to my notice. An almost unsurmountable objection existed against spreading the awnings at night. When up the river Euphrates in H. M.'s, then the H. C.'s Brig "Tigris," the men where obliged, in consequence of the extreme heat of night, to sleep on deck; and although the river is lined on either side by miasmatous date groves and rice fields, still it was with difficulty that I induced the lieutenant in command to protect the men under his care from the heavy dews and floating malaria. Again, when in charge of the H. C.'s Steam Frigate "Punjaub," first with the Bombay Light Battalion on board, and secondly with the right wing of the 2nd Bombay Europeans, for conveyance to the seat of war in Persia, it was only by urgent remonstrance, backed up by the surgeon in charge of the corps, that I prevailed on the first lieutenant and officer in command to spread the awnings at night over the men, sleeping thicker than "three in a bed," from the forecastle to the wheel.

The answers I frequently received when persisting in nightly recommendations that the awnings should be spread were, that a sudden squall might gather under them; that it interfered with the ventilation of the ship; that it was not man-of-war like! and that

exposure to the dews of night rotted the awnings!! Yet the capstan, made of brass and solid teak wood, was religiously covered with canvas every night, while tender flesh and bone—men going to fight their country's battles—might be exposed without remorse, to the destruction of their health and the impoverishment of the state.

The only objection to spreading the awnings which is worthy of one moment's consideration is, that it interferes with the ventilation of the ship. This, however may be easily obviated by keeping wind-sails up all night, and by furling awnings in the evening a little before sunset, and again spreading them before the damp of night begins to be deposited. Moreover, as in the hot nights of the tropics every one sleeps on deck, the ventilation of the parts below is not so important as the protection of the men above.

Formerly it appeared to be, both afloat and ashore. a very general opinion that the medical officer's duties were confined to examining the tongues and feeling the pulses of his patients; now, however, he is by the new regulations constituted the sanatory adviser, and therefore his recommendations, by *making which he merely fulfils his duty*, dare no longer be regarded as intrusive, impertinent, or interfering.

From this digression I now proceed to consider the means which should be adopted to keep the soldier from those intemperate habits to which he is unfortunately so wedded.

Intemperance frequently commences and is continued on the first arrival of the recruit in this country, and hence the regulations which were drawn up by the Bengal Medical Board in 1856, and which appear calculated to exert a very beneficial effect. They are briefly as follows. That new arrivals should not be allowed leave into the bazaars where the most deleterious and drugged liquors are sold, and where syphilis is exhibited in all its protean forms. That recruits should never be kept in the presidency towns, but forwarded immediately to out-stations, where

temptations are not so abundant. That recruits should be restricted to one bottle of beer per diem, till after the first season.

To lessen drunkenness, the system of paying the men each day is now in force, which is certainly a very judicious measure, tending as it does to prevent periodical debauch, the sure follower of a pecuniary plethora.

Until, however, a better educated order than the class of men who at present constitute the rank and file can be induced to listen to the persuasive mendacity of the recruiting serjeant, our soldiers must be regarded as little better than great children, and as such must be cared for, legislated for, and afforded that protection which the great majority neglect to seek. Hence, knowing the number of diseases which intemperance induces—knowing the slow chronic changes arising from continued imbibition of alcoholic liquors, only perhaps becoming clearly manifest when organic changes have rendered the mischief irremediable—knowing that each glass of spirits is a step towards destruction of liver tissue, and disease of the gastric mucous membrane—knowing that continual drinking is most baneful, by rendering the body prone at all times to take on disease, and less able to resist the destructive influences of the latter when unfortunately developed—knowing all this, I would unhesitatingly make the existing stringent rules affecting the sale of liquor to the soldier still more stringent, so that it should be difficult to obtain it under any circumstances whatever. Such orders might be difficult at first to carry out, but not impossible; and when severe punishment, inflicted by the powerful arm of military law, quickly followed the offence, the liquor-shops would soon be closed to the entrance of the European soldier.

This everywhere the case, intemperance, *per necessitatem*, must cease, and the men be confined to their regular rations and to the drinks obtainable from the canteen, more than which should never be allowed,

excepting on special occasions, or by the recommendation of the medical officer.

And by thus putting a stop to drinking, another fertile source of disease would be lessened; for by far the greater number of men would not so frequently accept the embraces of Venus, had they not previously rendered their devotions to Bacchus.

The prevention of venereal disease is too wide a topic to be discussed here. The establishment of Lock Hospitals for the treatment of prostitutes, a thorough supervision over the bazaar-women, and the encouragement of marriage, are the means from which the most satisfactory results may be expected. Inspections, although revolting, are also beneficial in detecting incipient disease. Many of these, however, might be avoided by trusting more to the honour of the men, and severely punishing those who concealed the disease.

I believe *ennui* drives many men to the sad occupation of drowning their sorrows in the "flowing bowl," and hence, of course, the profitable occupation of both mind and body, and the improvement of the soldier's *morale*, is a *sine qua non* among the means of preserving health. As a general rule, there is of late years ample amusement and recreation for the European soldiers, but they require encouragement to induce them to avail themselves of the offered means, and such encouragement can be only afforded by the example of the officers set over them. According to locality and circumstances, cricket, quoits, bowls, rowing, jumping, shooting, theatricals, &c., &c., form a sufficiently diversified list of salutary occupations; but it has been frequently noticed by medical men that the soldiers have often a *penchant* towards hanging and lounging listlessly about the barracks, rather than entering with spirit into the games mentioned above; and this apathy is only removable by the example and invitation of those holding a higher rank.

Of course, the reading-room, the coffee-room, the

school-room, and the savings' bank are now institutions forming part and parcel of the internal economy of every battalion.

Martinets may say "keep them at work," but we all acknowledge the truth of the nursery rhyme which specifies the condition of a certain "Jack" debarred from his established modicum of recreation.

But perhaps one of the most certain means of preventing both intemperance, and its certain sequel, syphilis, would be found in the encouragement of marriage among our European soldiers. Instead of limiting the number of married men to so few per company, I would allow, without restriction, all men of good character to contract matrimony when opportunity offered, and thus endeavour "by laws connubial tyrants to restrain." Under certain regulations regarding retirement, numbers might be induced to colonize the hill stations; and in process of time would arise a race composed of individuals possessing the European social characteristics, but having no aspirations beyond the land of their birth, forming safeguards to the state, and becoming centres from which Christianity and civilization would radiate.

I am aware of the objections which may be brought forward against increasing the number of European women beyond the regulated proportion; the principal being the increased expense they would necessitate, the want of accommodation for them, the inconvenience they are subjected to if the regiment is frequently moved, the mortality among them induced by the climate, and the prevalent idea that a soldier married is less efficient than one "without encumbrance."

Regarding the first objection, viz., increase of expense, I can only observe that, supposing one man only in any given number was reclaimed by marriage from drunkenness, disease, and death, the expenditure thus saved to the state would suffice to cover the additional expense of several women.

The want of accommodation for women in the

stations of India is certainly a graver objection to their presence than the plea of expense. Barracks are being erected, however, almost every day, and I would recommend that these be curtailed of their size, and a certain number of detached habitations built suitable for married men, but which might be occupied, if so necessary, by those not blessed with a *cara sposa*. The system of placing women and children in one common "patchery" is, I think, only less objectionable than allowing them to live without any official recognition.

Of course, when the regiment moves, the women and children must be subjected to inconvenience; but in no station of life would their path be without thorns, and therefore this objection is entitled to little weight. Moreover, with returning peace, military necessities will not be so urgent as heretofore; and if in the course of years state affairs allow of most regiments having their home or depôt in one or other of the hill stations, the families would remain there if the regiment was called upon to march at unhealthy periods.

By these means, by increased domestic comforts, and by residence in hill stations, the mortality now so great among European women and children would be reduced to such an extent that *their condition would be infinitely preferable* to that of their friends at home in the large manufacturing and seaport towns of Great Britain. The last objection is entitled to little weight. As a rule, the well-conducted men are the married soldiers; and these, knowing their wives and families were in safety, would not shrink from their duty in the day of trial.

But not only should intemperance in drinking be avoided, but also a frugal diet as regards edibles should be as much as possible enforced. The daily indulging in hot curries and spices is only less destructive to the gastric mucous membrane, and to the liver itself, than the habitual use of alcoholic liquors. As a general rule, the irregular preparation of such dishes

should be forbidden in the barrack cook-house; and the vendors of sausages, and other made-up articles from the bazaar, not allowed to tempt the men with their deleterious trash. Good plain food is the right of every soldier, and it would be hard to debar him from any kind of made-dish; and on the days when these were prepared, it should be the duty of the orderly officer or one of the surgeons to *taste* them, and to ascertain that the peppers and spices were kept within moderate bounds.

There is also another deterioration of the tissues which is known to occur among soldiers, and to be caused by too full diet, combined with *ennui* and want of exercise. Mr. Macnamara has pointed out that, these conditions being present, little wear and tear of the tissue occurs; and, owing to the same cause, a minimum of oxygen enters the system; so that the unburnt elements of starch and gum are stored up in the form of fat, generally, in the first instance, so affecting the liver. Dr. Chevers* points attention to the singular agreement even in minute details between the post-mortem appearances noted by Mr. Macnamara and those described by Gant, when detailing the "evil results of overfeeding cattle."

The next cause of disease, viz., the malaria and heat of the climate, is one over which the soldier himself has much control, and hence it is the more incumbent on those placed to watch over his health, that they may "diligent inquiry and true presentment make" as to the preventible causes of malarious disease, much of which certainly may be removed if only a sufficient amount of attention is given to the subject.

Sanitary improvements, however, in the first instance, cost more or less money; and the state exchequer, as all the world knows, is not suffering from plethora. If space permitted, however, I could point

* Chevers' 'Ind. An. Med. Sci.,' No. 10.

to effective sanitation in various localities, from which, as the statistics of disease show, the money cast on the waters, or, literally speaking, to drain away the waters, has been found many fold before many days.

Thorough drainage and clearing away of jungle and all deciduous vegetation form the most important matters for consideration; for, if these be not thoroughly effected, the most magnificent barracks will become little better than pest-houses, and the best sites comparatively unhealthy. On the other hand, a manifestly malarious locality may, by these simple measures, be rendered equal as a residence with the former. All observations, from the most ancient to the present period, mark the neighbourhood of undrained and marshy ground as injurious and inimical to human health and existence, and especially so in a tropical or semi-tropical country. Therefore, as the first step, the site of a cantonment should be thoroughly drained, and all hollows and holes filled up. If this is impracticable from position or other causes, the locality cannot be a proper one for the location of troops, and should be abandoned.

By clearing away jungle, I do not mean the destruction of all vegetation. On the contrary, greensward and trees in moderate number should be religiously preserved. The latter should be encouraged not only in the neighbourhood of the barracks, where they form a grateful shade in which the men can "eat the fresh air," but also along the roads in camp, and around the different bungalows of the station.

For a mile, however, round cantonment limits, nothing but trees, the larger shrubs, and greensward should be allowed to exist; all undergrowth and deciduous vegetation should be ruthlessly destroyed, and even on the trees themselves I would

> "Exert a vigorous sway,
> And lop the too luxuriant boughs away,"

keeping them all cut clear to a height of six feet from the ground. In short, "separate general orders" of

1856, under the head "Cantonments and Quarters," should be effectively carried out.

Differences of opinion exist respecting the beneficial efficacy of trees on the climate of a district; but this cannot be questioned, that they afford a grateful shade, are pleasing to the eye, regulate the amount of rain, and often have been of essential service as screens against a malarious-laden breeze.

How the desirability of utterly eradicating all deciduous vegetation in tropical camps could ever have been doubted, seems certainly a mystery; and yet numbers of educated men are to be found who, familiar with, and probably therefore contemptuous of, decaying vegetation, allow its luxuriant growth and decay in the immediate locality of their residences. Blessed, perhaps, with a powerful constitution, they escape for a period the serious consequences of inhaling a daily proportion of malarious atmosphere; but sooner or later the strong man is laid prostrate, and, the "doctor adoring," he seeks the aid of the scientific practitioner whose sanitary and preventive regulations he treated either with gentlemanly nonchalance or with vulgar unbelief and scorn.

Would that natural philosophy, the elements of physiology, and sanitary science, entered more largely into the studies of the military officer; then would he be assured, to the preservation of his own health and that of his men, that poisoned air "labitur et labetur et omne volubilis ævum" from decaying vegetable and animal matter, and from undrained and marshy ground.

Xenophon, in the dialogue between Cyrus and his father on the health of armies, makes the latter say:

"But thy chief anxiety should be to provide for the health of those thou oughtest to take care of, and to prevent the army from falling into sickness at all.

"*Cyrus.* And how shall I accomplish this object?

"*Cambyses.* If thou art about to remain long in a place, thou must first take care to pitch thy camp in

a healthy spot; and the bodies and faces of men are signs of both."

Hence the medical man, *who only can recognise* the insidious traces of disease, should always be consulted in such instances. Rule 6, section 21, of the 'New Army Medical Regulations' provides that he should be so consulted; and he must not then forget to institute an examination of the spleen, which will, as Mr. Dempster some time since showed, be an infallible indication of the prevalence of malaria in any given district.

Next in importance to the condition of the ground on which we live, is the edifice in which so much of our time in this country is necessarily spent.

The sanitation of barracks, hospitals, and bungalows are subjects on which volumes might be written. Lord Bacon remarks, "Houses are built to live in, and not to look on; and therefore let use be preferred before uniformity;" and hence, holding the opinion that the health of the resident is above every other consideration, I venture briefly to detail my idea of the manner in which barracks and hospitals ought to be constructed in this country.

First, they should be erected on arches five or six feet from the surface of the ground, in which arches lumber or stores of any kind should never be placed.

Secondly, they should be constructed of thin stone masonry, with iron supports for both walls and roofs, thus being rendered sufficiently strong to withstand any tropical hurricane (which ere now has been the cause of the downfall of barracks and the death of its inmates), and also not massive enough to retain and radiate heat, which is the case with the massive walls and timbers of which so many are composed. Although there are objections to the use of iron, which becomes extremely heated in the hot season, and cold in the winter, still this defect would be materially obviated by having the iron supports made hollow, with apertures at the extremities, for the circulation of air, and by encasing them in a sheath of

"chunam" or other non-conducting medium. Moreover, the iron fabric would not be liable to the attacks of white ants, which sooner or later cause timbers of any diameter to become untrustworthy and unsafe, even although the wood may have been submitted to any chemical process supposed to have the power of protecting it against the ravages of these destructive insects.

Thirdly, all buildings in this country should be constructed with double roofs, which, although collectively may be much thinner than one composed of more solid material, will, from the stratum of air between the inner and outer covers being a non-conducting medium, prove cooler for those who reside beneath. It is on this principle that iron fire-proof chests are made; and although the inner roof is only composed of mats or canvas, the air passing horizontally between, from apertures on the side to ventilators above, will, as Mr. Jeffreys observes, be an ever-watchful convector of heat.

Fourthly, the inner walls, instead of being white-washed, should be covered by some neutral-tinted colouring matter, as green or light yellow, thus obviating that glare which from white proves so distressing to the eyes.

Fifthly, the lower flooring should be composed of glazed tiles, instead of earthwork and cow-dung, thus enabling it to be cleansed with facility, and obviating that dampness which must always arise from mother earth.

Sixthly, each building should consist of two storeys, the upper being used as sleeping apartments in barracks, and in hospital as the sick ward, the lower being allotted for dining-rooms, reading-rooms, and convalescents' quarters.

Seventhly, the cubic space should be sufficient; for crowded hospitals and barracks are the abodes of death, most humbling and mortifying to the disciples of sanitary science. In tropical hospitals, 1500 cubic feet should be the minimum space allowed, with four

feet between the sides of each bed, and twelve feet from foot to foot.

Eighthly, water-closets should be attached to both storeys, and latrines should also be erected at a convenient distance outside. The former should be for use at night and on urgent occasions, the latter more commonly. All should be furnished with trapped apparatus, and be capable of periodical flushing; and the ordure and urine should be taken away three or four times daily by a staff of sweepers, who ought to be entertained in sufficient numbers to effect this very necessary business.

Ninthly, water-tap and washing apparatus should be near the water-closets; and bath-rooms outside, near the latrines; and the greatest care should be taken to avoid the water soaking into the ground, and so becoming a source of malaria. This can easily be effected by chunamed cisterns and drains.

Tenthly, the cook-house and style of cooking should receive more attention than it very frequently does in this country.

Now the same construction, with certain modifications, is equally desirable for any building intended to be used as a hospital; and the arched basis for the superstructure, the double roof, the glazed neutral tint for the walls, the tiled flooring, and the two storeys, if possible, should always be insisted on. Of course, a proper amount of cubic space for each patient is imperatively demanded; and the remark of Sir John Pringle should be recollected, to the effect that the best rule is to admit so few patients, that "any one unacquainted with the danger of bad air might imagine there was room to take in double or treble the number." Hence, a space of at least 1500 cubic space should be allotted to each individual patient.

Regarding ventilation, I believe that the less *scientific* the plan adopted may be, the more useful will it prove in this country. If a ward is to be kept perfectly sweet, the air must flow through it in

correspondence with the movements of the atmosphere without; therefore the windows ought to reach near the ceiling, and be furnished with venetians to regulate the draught. In countries where fires are necessary, and where doors and windows are usually kept closed, other means of ventilation, as Dr. Chowne's air-syphon, Roberton's capped tubes, &c., may be desirable adjuvants; but, for our Indian hospitals and barracks, *natural* ventilation is the *sine quâ non*. Ventilators in the upper roof, others communicating with the space between the two roofs, and others above and beneath the doors or windows, should always be placed as, in wet or cold weather, they will be required; but, however desirable they may occasionally be, they cannot supply the want of natural ventilation. I need scarcely add, that all such ventilators should be capable of being closed at pleasure.

I have recommended that both hospitals and barracks should consist of two storeys; and I am aware that many old Indians will exclaim, "Never heard of such a thing!" and bring forward numerous objections to the plan. As regards the barracks, it has been mentioned to me that the men would not approve of the trouble of going up and down stairs. This, however, would not be any great amount of labour, as they would only *sleep there*, and live during the day in the lower rooms, keeping everything but their beds below. In the hospital also convalescents only would remain below, and the sick wound up-stairs on a stretcher, the same as is so satisfactorily carried out in some of the London hospitals.

Every one agrees in the fact that malaria is more abundant and powerful near the surface of the ground, and the damp and mist of night is seen often not extending many feet above the earth. It is also equally true that any individual is more liable to receive poisonous impressions from malaria during the hours of repose than at any other time. No one questions the fact, that an elevation of some feet from the ground is cooler and more conducive to tranquil

rest than the lower storeys. The inability to sleep is fully admitted as a direct cause of debility and irritability, and consequently of extreme proneness to endemic disease. The musquito, that minute plague of tropical nights, dislikes an elevated and breezy room.

For all these reasons, therefore, I urgently represent that all barracks, hospitals, and bungalows in tropical climates should be furnished with upper sleeping-apartments; and I believe that the individual who habitually passes the night in a raised room has a very considerably greater chance of health in this country than he who sleeps on the ground floor, while the comfort gained by the latter method of spending the time need only be once tried to be fully appreciated. *Not to sleep in comfort in India is to prepare the system for disease.*

If all our soldiers slept in upper rooms, free from malaria, heat, and earth-damp, the hospital list would undoubtedly be less than it is; if they passed the night free from intolerable heat and numerous musquitoes, we should never hear of soldiers drinking to obtain a few hours' forgetfulness—hence less intemperance, less neglect of duty in the morning, and a still smaller number of sick.

But upper-storeyed buildings, built with sufficient firmness, are expensive. I believe, however, that decreased mortality would amply repay increased expenditure.

Supposing the European in India to be housed, fed and treated, as I have so briefly sketched, he would, when in cantonment, be but little exposed to the causes of disease. When on the march, however, or when engaged in active service, circumstances are altered; and, accordingly, other sanatory measures are demanded. Space, however, will not allow me to enter into details on these interesting subjects; and I shall merely mention a few of the most important particulars which the sense of

duty should lead the medical officer to recommend, when placed in charge of troops marching in this country.

And, first, respecting the period of the twenty-four hours which should be fixed upon as the most appropriate season for marching. Much difference of opinion has arisen on this point, and eminent authorities have not been wanting who have condemned the general custom of marching in the early hours of the morning. Thus, Ballingall recommends "an hour's more sleep, and an hour's more sun;" and it has also been brought forward as an argument against early marching, that the greater number of cases of insolation take place during the small hours of the morning. Other objections are, that the men are called out into the cold damp air of night, perhaps remain standing about for some time, and thus are liable to chills and the consequent colicky pain of bowels, or diarrhœa, or perhaps ague. Annesley also advised that night marches should, if possible, be avoided, on account of their depriving the soldier of his rest, which cannot always be procured in the heat of the day; and this author, moreover, states that in the Carnatic, where damp is not so prevalent, early hours would be advisable; while in Mysore, Hyderabad, and the ceded districts, where there are heavy fogs and dews, troops should not be taken out before they are dissipated.

As a general rule, it appears to me that the afternoon is the proper period for marching; but in the very cold weather of northern India there is no reason why the troops should not move by daylight, commencing the march with the first glimpse of dawn. When marching at other seasons, four or five o'clock in the evening appears a more suitable season than the early hours of the morning; the system, fortified by the previous dinner, being less liable to the poisonous effects of malaria than it is when sleep has been disturbed, and the digestive organs long unemployed.

Of course the cold season, or the period from November the 1st to the end of February, is the time when all troops should, if possible, be moved. Instances are numerous where the most disastrous results occurred to regiments, both European and native, marching during the hot or rainy months.

One of the chief causes of disease to be guarded against on the line of march is damp, and perhaps this will be least felt by enforcing the use of a tarpaulin-sheet laid over the straw or "kerby" forming the bed.

Fatigue is also a frequent source of disease, and hence, unless military necessities are paramount, the distance of each day's march should not be far, or the pace fast. A fourteen-mile march (farther than which should not be attempted in India) cannot be made, including halts, in less than four hours and a half.

It is important that a sufficient number of bheesties accompany the men, to supply them with good water; and each soldier, moreover, should be furnished with a string for his tin can, in order that, on arrival at a well, he might draw water for himself, such water having been previously *tasted* by the medical officer.

The choice of the locality for forming the camp should not be left to the quarter-master or to the commissariat officer, but the medical officer should always proceed in advance. Then elevated and dry soils, the declivity of hills, elevated banks of rivers, with sufficient slope either way, tongues of land jutting into the sea, and soils supplied with good spring water, would be invariably chosen; instead of damp or cracked ground, dried beds of rivers, tanks, or gorges, marshy grounds or sites to leeward of marshes, jungly ground, or the low banks of rivers or lakes.

If obliged to camp in manifestly unhealthy localities, as at the foot of ghauts, a prophylactic dose of quinine should be administered to each man, and the floors of the tents, particularly of the hospital, raised

with straw mats or tarpaulin. Large fires about the encampment will also tend to destroy malaria.

The Indian head-dress, particularly in the hot weather, should consist of a tolerably tightly fitting helmet, by which the perspiration is confined, and the scalp kept moist. The ventilating hats, so vaunted by their contrivers, do not fulfil the expectations excited; the apertures round the head allow the hot air to pass freely over the scalp, and, maintaining it in a constantly drying state, actually predispose to the affections they were designed to prevent. All sun hats should be furnished with a shade for the upper portion of the vertebral column, and be covered with white cloth, which, even in the shade, reduces the temperature two degrees, and in the sun from 130° to 111°. A wet towel placed in or on the head-dress is frequently to be recommended.

Having thus provided, as much as possible, against exposure to malaria, fatigue, damp, and heat, the soldier will, by the adoption of the under-mentioned precautions, be placed in as good a position to escape disease as the nature of his duties will permit. These additional requirements are the Berrington knapsack, by which pressure is *not* made over the chest and arms; freedom from the stock (now happily abolished in India), by which free circulation through jugulars and carotids are ensured; khakee clothing and the serge tunic, by which freedom of motion is allowed; the helmet instead of the forage cap, or the latter with the French peak and a good turban; the abolition of the morning dram, and issue of coffee (now also the usual practice); the wearing of flannel shirts; a very segregated order of marching, so that the ranks may be ventilated; and, lastly, a light at the head of the column, to move off by in the night, and so to prevent the occurrence of accidents.

Of course, when "bella, horrida bella," are being carried on, military reasons ride triumphant over all medical and sanitary regulations; but at all other times, when there is no enemy to the front, the

health of the troops should be, as ordered, "the paramount consideration;" and it is a task worthy of the highest ability to endeavour to decide

"What good, what not; what excellent, what ill."

CHAPTER III.

ON HILL AND MARINE SANITARIA.

But superior to every other means of preserving the health of Europeans in India is residence on an elevated site—on one of those islands on the plain, which, by its elevation, removes the European from the debilitating heat of the low lands, and places him in a climate more resembling that of which he is a native. The advantages of elevated sites for the residence of Europeans in tropical climates have long been known to medical men, who, from the time of Lind to the present, have not ceased strenuously to recommend the adoption of this sanitary measure, the necessity of which is now fast becoming evident to all.

Thus, Sir Hugh Rose, then commanding the Bombay army, writes, through his adjutant-general, Colonel Stock, in a letter dated July, 1860, addressed to government:—"The subject" of this letter (hill sanitaria) "is an all-important question in a military, political, and financial point of view. As regards the military, they are so connected with the political considerations, that it would only occasion confusion and waste of time to treat them separately. A military advantage is a political one in India, and late events have proved that to our military power, more than to any other influence or causes, must we look for our

possession of this country. Money is called the sinews of war; but the health of the troops is a still more important requisition. Sir H. Rose feels thoroughly convinced, that if the question of military sanitaria in the Bombay Presidency were thoroughly gone into and considered, it would be found that the percentage of military sickness might be reduced to a proportion which would render the European troops one third, perhaps a fourth, more efficient than they actually are." Long may Sir Hugh Rose live to hold these liberal sentiments—to order and to appreciate the benefit which will most assuredly accrue from these views being carried out!

The advantages of hill climates consist, first, in elevation above the stratum of hot wind, which in the summer months passes like the blasts from a fiery furnace over the whole length and breadth of the inland plains; secondly, the consequent relief from the debility engendered by this condition of atmosphere, and by the sleepless nights arising from the same cause; thirdly, exposure to a less intense form of malaria than that generated on the plains; fourthly, the complete immunity afforded by some hill stations from attacks of cholera; fifthly, the greater amount of physical exercise which may be taken in the open air; and, from the operation of all these causes, a great immunity from the diseases sketched in this work, probably a total exemption from that cachexia loci under which so many succumb, and the maximum amount of physical comfort and satisfaction.

The disadvantages are the great degree of cold in the winter months, the sudden change into which from the plains below has a tendency to lead to internal congestions; hill diarrhœa and dysentery, so prevalent at some stations, almost unknown at others; and the fog and damp of wet months, which are, from obvious causes, more persistent than on the plains. Although the Mahamurree, or Indian plague, small-pox, diphtheria, typhus fever, hepatitis, and cholera have been noticed on hill stations, principally in the

Himmalehs, still this cannot be considered as a disadvantage, comparatively speaking; for even those (and there are such) who attach very little curative influence to the climates of hill sanitaria generally must admit that, perhaps excepting typhus fever, the occurrence of such epidemics is very rare in elevated localities, compared with the numerous manifestations experienced on the plains.

It has been already stated that one of the great advantages, in fact the greatest, derived from hill stations is the removal of the resident there from the hot atmosphere of the plains; and an elevation of about 4000 feet above the sea level is sufficient to secure this, the lower or hot region, as has been demonstrated by M. Von Mühry,* extending to a height of little over 3000 feet. This fact, indeed, must be evident to any one who has ascended tropical mountains, the change from the lower or hot regions into the middle or temperate being too strongly marked to escape notice. Thus, in this one essential an elevation of 4000 feet or upwards is required.

Martin† states, in the climates of yellow fever, an elevation of 2500 feet is found sufficient to remove the European from the locality of pestilence, without placing him in that of bowel disorders; and hence the inference that elevated places may be found in the East, which shall alike be free from malarious fevers and from disorders of the bowels.

It is, however, very questionable if mere elevation has any direct influence at all in retarding the formation of malaria, and the consequent prevalence of intermittent or remittent fever. Intermittent fever originates in some of the Himmaleh stations. At Aboo also, during the malarious months, ague is very prevalent. Dr. Cooke (Bombay service), in his annual report of the Kelat agency, states that "Khelat, the highest inhabited spot of the Beloochistan table-land,

* Review of Von Mühry's work, 'Brit. For. Med.-Chirurg. Rev.,' Jan., 1859.

† 'Letter to Court of Directors,' August, 1857.

standing 7000 feet above the level of the sea, is also malarious."

But fevers from this cause are certainly less intense on elevated sites than in the plains beneath; and I believe that this fact is not to be explained by supposing that elevation forbids the formation of malaria, but is rather due to the improved vital force acquired as a result of removal from the plains to a temperate region. The system is braced, lassitude disappears, the great restorer of wearied nature, calm sleep, is obtained, and the individual is enabled to defy that amount of poison in the atmosphere which would have prostrated him in the plains below.

Whether on plains or on mountains, the necessary conditions being present, that agent which we call malaria will manifest its presence by the well-known diseases it calls forth; and wherever these phenomena are persisting, there drainage and other sanitary measures may be safely stated to be necessary. It is only in proportion as mountains are better drained, ventilated, and cleared of jungle, that they are more free from malaria than the plains below. I can point to localities on mountain ranges in India, with an altitude of upwards of 3500 feet, which are quite as swampy and unhealthy as the most notoriously miasmatous bog on the plains. As a rule, hills are of necessity more exposed to the winds, and therefore better ventilated, than lower positions; but even this statement does not always apply, as there are valleys and flats near the summits of mountain ranges overhung by higher eminences and peaks, and hence thoroughly deprived of all perflation. Such localities are of course to be avoided as human residences.

All mountain stations should, if possible, be fixed on the summit of the range or portion of the range; otherwise they should be placed, with due reference to the prevailing winds and rainfall, on the slope or declivity of the eminence. If the highest ridge is surmounted, and a basin-like space found to exist, such position, however pleasing to the eye it may appear,

should be shunned; for it is certain to retain water, to be marshy, to be difficult to drain, and not to admit thorough perflation of air.

Thus the sanitary station of Poorundhur, on the Mahabuleshwar range, is remarkably free from fevers of the intermittent or remittent type,* the situation of these mountains in relation to the surrounding country being insulated,† and the sanitary station itself being built on the declivity of the mountain; while Mount Aboo, or that portion of it inhabited by Europeans, gives rise to diseases of the same nature, as the station is located in a basin some miles in circumference, but surrounded on all sides by higher eminences than the altitude of its site.

Examples of this kind might be multiplied by reference to the Himmalehs and Neilgherry Hills.

Some hill stations afford a complete immunity from cholera. Dr. Mac Kennon holds it as an undoubted fact, that the cause of cholera has, on ordinary occasions, no existence at the elevation of 6000 feet. The disease has, however, occurred at Kussowlie, near Simla, which is nearly 7000 feet above the level of the plains; at Murree, with an elevation of 7330 feet above the sea level; at Dhurmsala, having about the same height; and at other hill stations on the Himmaleh Mountains. But at Mount Aboo, at Mahabuleshwar, and on the Neilgherries—all, be it observed, *inter-tropical* localities—cholera has never prevailed.

This fact leads to the question, Are not inter-tropical mountain regions more suited for the residence of Europeans than other elevated localities without the belt of the tropics? and a reference to the paper of Dr. Chevers,‡ in the 11th number of the 'Ind. An. Med. Science,' tends to show that such is the case.

* "Pract. Observ. on the Effects of Hill Climates," 'Trans. Med. and Phy. Soc. Bom.,' 1841.

† "Observ. on the Clim. of the Mahabuleshwar Hills," ibid., 1838.

‡ "On the Means of Preserving the Health of European Soldiers in India," 'In. An. Med. Sci.,' No. 11.

I now subjoin an extract from my 'Annual Report on the Sanitary Station of Mount Aboo,' dated 31st December, 1860, and forwarded to the director-general of the Bombay army, Dr. Rooke, in the usual official manner, and who honoured my communication by placing it before the meeting of the Bombay Medical and Physiological Society, held February, 1861.

After stating that the medical topography of Mount Aboo has been previously described, I continue:

"I must, however, premise my remarks by recalling to mind that the sanitary station of Mount Aboo is situated rather under and to the north-west of the highest point of this portion of the mountain, the general level being rather upwards of 4500 feet above the level of the sea. The station itself is situated in a sort of hollow or basin, surrounded on all sides by eminences from 400 to 1000 feet high, the circumference of which, at a rough guess, may be from ten to twelve miles. The cantonment consists of numerous hills and valleys, or rather ravines, and on the summits of the former are generally built the residences of the European inhabitants and visitors. Some of these bungalows are 50, 70, or 100 feet above the general level of the station, and some of the ravines are perhaps nearly that distance below. Hence the locality has a very beautiful appearance, presenting 'ever-varying, ever-new' features to the stroller in search of the picturesque.

"The rocks are composed of granite and trap, with veins of quartz in almost every locality in the neighbourhood of the station.

"The extreme of summer heat in the shade is 90°; the extreme of winter cold is below freezing point. The average daily temperature throughout the year is 69°. During the cool months there is nothing to prevent a person in moderately good health taking exercise during the middle of the day, provided he wears a turban or other protection for the head; while the nights and mornings are so cold as to induce a desire to aid the circulation by brisk walking exercise.

"From this slight description of the station and the climate, it will probably be imagined that nothing more could be required to produce a perfect hill sanitarium; and such, indeed, is physically the case.

"Nature, as she usually is, has been all-bountiful. The North Wales beauty of the place has been already referred to. The cold weather has been shown agreeable and bracing to the healthy European. The hot weather is never debilitating, the thermometer seldom exceeding 80°, thus nearly approaching that happy medium long since recommended by Lind as a suitable retreat for Europeans serving in the tropics. The rains, during which an average of fifty-five inches falls, are not characterised by that extreme degree of moisture which must exist on the Mahabuleshwar range, where the almost incredible amount of 297 inches has been measured in one year. Bowel complaints, diarrhœa, and dysentery are not prevalent diseases, as at Simla and other Himmaleh stations, where their frequency is proverbial. Although cholera has prevailed on the plains below, and even been brought up the mountain by pilgrims to the Dilwarra temples, there has never been known a single instance of an European or native residing at Aboo suffering from the disease.

"The station also appears to afford a like exemption from the disease described as hill colic, and also from the Mahammurree, or India plague, which formerly ravaged the Himmalehs from the snowy range downwards.

"The sites of some of the buildings are excellent, and there is still room for more. English vegetables will flourish if properly tended, and the rose tree forms a luxuriant hedge. Game may be had, if sought after, and the surrounding neighbourhood presents many pretty and interesting spots for visits and excursions. The station is also sheltered by eminences and peaks, and the water is free from any great amount of organic or mineral impurity; and although

obtained from wells, it contains but a small quantity of lime or other salts.

"Yet with all these natural advantages—and it must be confessed they are great indeed—the station does not fulfil the idea I entertain of what a hill sanitarium should be, and this because the labour of man has not increased the advantages and capabilities of the locality, and because sanitary science and medical hygiène have not been made available to the extent which, I respectfully submit, ought to have been the case."

And this is the fault which obtains in many hill stations. As stated by Mr. Grant,* of Simla, "Nothing can be worse than the state of conservancy."

The fact is, too much has been expected from hill climates. No locality at home is healthy without the sanatory condition is attended to; neither will Indian stations on mountains or plains form exceptions to this law. If sanitary science and medical hygiène be neglected at hill stations, *the most that can be expected from them will be refuge from heat during the two or three hot months of the year.*

The curative powers of hill climates are exceedingly limited. Dr. Moorhead, in his 'Memorandum on the Sanitarium of Poorundhur,' writes, "The object of this sanitarium is to promote the restoration to health and strength of soldiers who have become debilitated from the effects of climate, or from recurrences or from long duration of various forms of disease;" afterwards qualifying the statement by remarking, that "these beneficial results occur with greater certainty in convalescents in whom there exists no internal disease, or marked tendency to it;" and this, indeed, is the fact.

It is therefore found, as a general rule, that young soldiers, whose constitutions are not fully formed, derive more benefit from hill climates than those of several years' service, who have become organically

* Mr. Grant, 'Ind. An. Med. Sci.,' 1853, "On Hill Diarrhœa."

diseased, or who exhibit symptoms leading to such supposition.

The following, published in general orders, 2nd Nov., 1860, refers to the class of convalescents likely to be benefited by the hill climate, and is an extract from Dr. Morehead's memorandum:

"The class of convalescents hitherto referred to as likely to be benefited by this climate are—first, those who have become reduced in strength from recurrences of intermittent or remittent fever, at Poona or other adjacent stations, in June, July, August, and September, may with advantage reside at Poorundhur from the beginning of September to the middle of November. After this period, however, such cases had better be returned to Poona; for, from the middle of November to that of February, there will be a greater liability to re-attacks of fever in the hill climate than at Poona. Second, those who have suffered from recurrences of malarious (intermittent or remittent) fever in October, November, December, January, and February, may be sent to the hill with every prospect of benefit in the month of March, the duration of residence in each instance being prolonged, or not, according to the necessity. Third, young recruits, debilitated from attacks of common continued fever (febricula), in March, April, and May, will, after convalescence has fairly commenced, be benefited by the climate of Poorundhur. Fourth, those whose health and strength have become enfeebled from the general effects of a tropical climate, or from strumous or allied diathesis, and in whom chronic lymphatic glandular swellings or indolent external ulcerations are present, are likely to derive advantage from a residence, more or less prolonged, between the beginning of March and middle of November.

"The months in which invalids may resort to Poorundhur are—first, from the commencement of September to the middle of November, regard being had to the character of the monsoon weather in different years in the first-named month. From the

middle of November till towards the end of February, convalescents of all kinds are probably better in Poona than at Poorundhur, and, as already stated, it will generally be expedient to return to the former station invalids who have been sent to the hill in September and October immediately preceding. Second, though invalids already at Poorundhur, and who have been resident there for some time previously, are generally improved by the climate of July and August; it is, however, unadvisable to send them there in these months. Third, March, April, and May are the months most suitable for the transfer of convalescents to Poorundhur. A great variety of cases may be sent at this period; and they can have the advantage, if necessary, of a continued beneficial residence of eight months and a half, viz., to the middle of November. In many cases, more or less of the climate of March, April, and May is necessary to fit the constitution for deriving benefit from the monsoon months."

"Republished by order of the Principal Inspector-General, Medical Department,

"W. C. Coles, M.D., Assistant-Surgeon,
"Bombay; 15*th November*, 1860. Secretary."

As regards the generality of hill stations, this summary, I believe, cannot be improved upon. Broadly speaking, organically diseased patients should never be sent to the hills; and, amongst such affections, rheumatism must be classed. To these, and to others, as Baillie observes, the subjects of the atrophy of advanced years, consequent on long residence in the country—not young men suffering from cachexia lœi or splenic leucocythemia—cold acts as a complete "extinguisher."

Although the curative properties of hill climates are thus limited, I believe that the preventive powers are almost unlimited; and hence I must enter my humble protest against the hill climates of India being *only* regarded as convalescent depôts. Individuals come out from Europe, remain in the plains until they

become seriously, perhaps organically, diseased, and are then probably sent to the hills; the climate of the elevated region does not produce an alteration for the better, and hence it is condemned as of no avail. But suppose the same persons had gone to a hill climate immediately after landing in India; suppose them to have gone there with their constitution undeteriorated, and their Europe-made blood retaining its western vital properties; then, indeed, taking their daily amount of exercise, gaining their usual hours of nightly repose, retaining the balance of cutaneous and hepatic sympathy and circulation—in short, free from all the debilitating effects of the Indian plains—then, indeed, the same individuals would live as at home, free from any extraordinary causes of disease. Fresh from the west, they would be able to withstand the diluted malaria of a hill station; and if that station were under proper sanitary regulations, they would not only be able to do this, but, in the absence of malaria, they would flourish, and, if soldiers, live in greater comfort, and with a better prospect of attaining a green old age, than their relatives, the miners, the colliers, the needle-makers, or the factory hands at home.

Were all our soldiers located on hill stations immediately after their arrival in this country, the saving to the state would be enormous. To house a man costs but little; his death, some £100 or upwards.

Political necessities, however, forbid that this now-apparently Utopian scheme will soon be adopted. Soldiers are not brought to India to be cooped up in hill sanitaria, but for service wherever a large city or turbulent population may require the near presence of a military force. Science, however, progresses, the schoolmaster is abroad; and it is not too much to hope that a network of railways will soon divide the empire; that the natives generally may entertain a more exalted opinion of our unseen power and declared justice; and that, in consequence, it will be permissable

to desert many of our unhealthy lowland stations for the healthier regions of mountain ranges.

Excepting political reasons and the exhausted treasury, a plea has never been brought forward against making large military stations on mountain elevations, which can be considered worthy of serious consideration. It has been stated that regiments moving suddenly from the hills to the plains are very liable to be attacked by epidemic disease. This was certainly the case with the 1st Bengal Fusileers, the 2nd Bengal Fusileers, and H.M. 75th Regiment, who, in 1857, respectively left the Himmaleh stations of Dugshai, Subatho, and Kussowlie, to take part in the siege of Delhi. The first-named regiment marched sixty miles in thirty-eight hours; the 75th did forty-seven miles in two marches; the 2nd Fusileers moved in the same rapid manner; and this in the month of May. Each of these battalions was attacked by severe epidemic cholera, from which a large number of men were lost. Such instances, however, are quite exceptional cases. There was no time to make arrangements for carriage, proper sanitation, or to secure a good supply of water. The men drank the latter fluid as they could obtain it from puddles and rice fields at the roadside. Moreover, the 75th Regiment had only been one month in the hills, and it is to be presumed that in each battalion were a number of weakly constituted men, who probably had become debilitated, and perhaps insidiously diseased, by previous residence on the plains. We do not find that soldiers sent to India overland, and who took the field immediately on arriving in this country, suffered from disease in any undue proportion; and had the regiments mentioned never been located on the plains, it is more than probable that their *physique* would have been that which would the better have enabled them to bear up against the operation of those causes—fatigue, heat, and exposure—under which so many succumbed. Even supposing this should not, in future, prove to be the case, it must be admitted

that while soldiers remain on the hills the mortality would be infinitely less than if located on the plains; and surely it is preferable, in every sense, for regiments to be ravaged by epidemics on exceptional and rare occasions than for the men to be always exposed to morbific influences.

The kind of barracks which should be erected for soldiers on hill stations has been the subject of some difference of opinion. Many authorities, amongst whom is Martin, think hutting the men is as good a plan as can be pursued. Considering, however, the extreme cold which prevails on elevated regions in the winter months, that hoar-frost, ice, and even snow are common, I opine that barracks in such localities should be constructed much on the same principle as those designed for colder climates. For married men substantially built cottages should certainly be allowed.

It is not, however, for adults alone that hill climates are so desirable. The mortality of children in India is enormous—in Bengal 84·2, in the Bombay Presidency 70·7, and in Madras 39·8 per 1000 per annum; while in the most unhealthy of our manufacturing towns at home it only reaches 22. Much of this melancholy destruction of life arises from want of care on the part of ignorant parents, as Dr. Carter's 'Medical History of the Schools in Bombay' sufficiently demonstrates, the mortality being after the establishment of a hospital but 21·60 per 1000.

That even this would be most materially reduced by residence on hill stations there can be no question. In fact, this is proved by the working of the Lawrence Asylums, established by the philanthropic Sir Henry. At Kussoulie, out of 136 inmates, all young children, only two died in as many years. At Octocamund the mortality has not been greater; and at the Mount Aboo School but one death has taken place during the five years which has elapsed since its establishment.

Any one who daily observes, as I have done, the children in the latter school—who contrasts their healthy, happy, rosy state with the condition of others, pale, anæmic, and pining, in the stations of the plains—cannot but be satisfied that the right plan has been pursued. Of the superior moral training they receive in the school, and of the advantages they enjoy away from the contamination of a barrack life, I need not here dilate.

This naturally leads to the subject of the colonization of India by Europeans and their descendants. The question, Can a healthy and vigorous European stock be propagated in this country? has been invariably answered in the negative. That this is true with regard to the plains does not admit of doubt. A third generation of Europeans does not exist in India, for the Portuguese are all now of mixed descent; neither is there the slightest ground for hope that such will ever be found existing, and produced on the plains. The debilitating effects of the climate, the heat, the malaria, and the loss of *physique* forbid.

In hill climates, however, guarded by proper sanitary measures, there is a strong probability that Europeans and their descendants "continuously could live," if free from the *res angustæ domi*. Whether the same could engage in daily labour in the open air, and pursue the same laborious occupations of the lower classes at home, is open to great doubt. Some of the elder boys and girls, from fifteen to eighteen, in the Aboo Lawrence School at the present time are as well grown and firmly textured as others who have never left their native land. Experience, however, will alone decide if their progeny will manifest the same conditions.

Whether there is scope in the different mountain ranges for the employment of European labour is another question. The cultivation of tea, coffee, and cinchona — if found that the latter will flourish in this country—forms a wide field for occupation. But the beer-drinking and flesh-eating European, albeit he

is able to do a better day's work than the native, will never compete, pecuniarily speaking, with the latter and his simpler wants.

From these considerations, and others of which space will not admit, I opine that the only colonization which will ever take place in India will be by a race of individuals of better social position than the daily labourer. That such a class might exist on the mountain regions does not, I think, admit of doubt.

The elevated regions which appear to offer inducements to the medical topographist are, in addition to the Himmalehs, the Aravelli Range, the Neilgherries, and Mahableswar, on which sanitary stations exist. on the Pulney Hills, the Shevaroy, and Coilamullay Hills, the Baramah, Coimbatoor, and Travancore Hills, and the Cossyah range near the tea-growing countries of Assam and Cachar. Each of these localities must possess restorative and preventive excellences peculiar to themselves; and, as Dr. Chevers observes, it "should be the task of the best geological. engineering, and medical science in the country during the next few years to select and adopt from them."

Marine sanitaria are of immense service as restoratives to health, in many cases of superior efficacy to hill climates. For the organically diseased, those long resident in the country and suffering from the atrophy thereby induced, for liver affections, dysenterie disease, the sea-coast is preferable to the mountain range. The great heat of the climate is tempered by the sea breeze; the nights are rendered cool from the same cause; and water being in front, or in some instances nearly surrounding, the generation of malaria must be reduced to a minimum.

Sea-coast sanitaria should be placed on high cliffs—if jutting out into the sea, so much the better—to the base of which the water reaches even at low tide, or at all events where clean sand only is left uncovered. All positions, as in gulfs or arms of the sea, where acres of mud are periodically covered, and the reverse. should be avoided, as the effluvia frequently arising

from such tracts is only less prejudicial to human health than paludal malaria. If such can be readily found, a neck of land stretching into the sea should be chosen, and in all cases the open ocean in front should be a *sine quâ non*. Of course, the surface of the ground composing the shore, and the surrounding country, its capabilities of drainage, and freedom from marsh and jungle, must be taken into consideration when fixing the site of a marine sanitarium or cantonment.

PART II.

Section I.—Diseases depending on Malarious Influences as a chief cause.

CHAPTER 1.

THE DIVISION OF INDIAN FEVERS.

Although the 122nd Brunonian proposition asserts that debility is the cause of intermittent as well as of every other fever—although Dr. Burdel* regards marsh poison as a myth, and although the same opinions have been advanced by Dr. Knapp† and others—still, as we know that, certain circumstances being present, remittent and intermittent fever will arise, we are surely justified in the theory that something poisonous must pass into the atmosphere, which something, although only recognised by its effects, we term malaria.

Excluding the exanthemata, we may recognise seven kinds of essential fever in India, viz., remittent, intermittent, masked malarious, typhoid, elephantoid, ardent, and ephemeral.

These, excepting the two last, are more or less paroxysmal, and hence may be considered as affecting chiefly the sympathetic system.

They are described in the following pages under the heads of their chief exciting causes.

* 'L'Union Médicale,' No. 139, 1859.

† 'Researches on Primary Pathology,' 1859.

CHAPTER II.

REMITTENT FEVER OF INDIA.

This disease was described by Lind, under the title of Putrid Remittent Marsh Fever; by Jackson, as Bilious Gastric Remittent; by Dr. Balfour, as Putrid Intestinal Remittent; by Annesley and Sir J. McGrigor, as Bilious Remittent; and by other authors, as Inflammatory and Congestive Remittent, Jungle Fever, Frae Fever, Malarious Fever, Hill Fever, Malignant Remittent, and the Endemic Fever of Bengal.

The variety of synonyms will at once manifest how great must be the changes in the characteristics of the disease under the influence of locality, season, constitution, and circumstances adverse to medical treatment.

Remittent fever is most prevalent near the marshy banks of rivers, at the base of mountain ranges, on lands subjected to periodical inundations or profuse irrigation, in jungles, near drying salt or fresh-water marshes, near beds of rivers, in arid, sandy, barren districts, with moist subsoil, on red sandstone rocks or ferruginous earths, in volcanic countries, and in certain hilly districts.

Causes.—Depressing passions, fear of disease, privation and excess both of food and drink, the subsequent collapse of intoxication, undue fatigue, long marches, want of sleep, damp clothing, exposure to the sun and night air; in short, everything tending to lower the system predisposes to the disease, which will be excited by residence in, or passing through, the localities specified above, and consequent exposure (particularly by night) to the emanations from dead or living organized matter and other exhalations there known to be so abundant.

There is also good reason for supposing that the

use of stagnant water, containing decomposing vegetable matter, as is the case with many of the wells and tanks of India, may be an exciting cause of the disease.*

Symptoms.—The access of the disease may be sudden, or, as perhaps more frequently happens, weakness, lassitude, mental depression, headache, and general uneasiness, exist for a day or two. This stage is succeeded by paroxysms of cold, shivering, intense pain, and tension of head, soreness of eyeballs, more or less aching of the back and limbs, nausea, probably bilious vomiting or purging, with epigastric pain and præcordial oppression. The conjunctivæ are frequently tinged yellow; eyes appear dim; countenance anxious; tongue coated in the centre; surface dry and corrugated; and urine generally scanty and high coloured, but occasionally plentiful and limpid.

This condition, which may be called the first stage, lasts but a short period, and in many cases is but feebly marked. The second stage continues longer, frequently for eight hours, and is characterised by the pulse becoming 110 to 120, hard and jarring. Respiration is hurried, with great restlessness and heat of surface; frequently confusion of ideas or delirium; sometimes yellowness of the whole body, which may come on *suddenly* or gradually. Tongue dry, urine scanty and high coloured.

The remission, which is more or less complete, and occurs at variable periods, according to the mild or severe character of the fever, is indicated by perspiration, reduced temperature, soft pulse, easy respiration, and oftentimes refreshing sleep. The duration of the whole paroxysm in an uncomplicated case is about twenty-four hours.

Complications.—1. *Remittent fever tending to become continued and typhoid.*—Here the paroxysms run into one another without the least remission being

* 'Bombay Government Records,' No. 20, "On the Water of Mullahs in Jungle Districts."

observable, or, perhaps, a double paroxysm may be recognised in the twenty-four hours. About the third or fourth, or sometimes not until the seventh or eighth day, typhoid symptoms, dry tongue, sordes on the teeth, subsultus tendinum, petechial spots, and melæna supervene.

2. *Sudden Syncope.* — This result may occur at any period, but is most frequently observed after the sixth or about the seventh or eighth days; and, probably, after the patient has been imprudently raised into the erect posture. The symptoms are those of collapse—thready pulse, sunken features, and cold surface.

3. *Cerebral Irritation, Congestion, or Inflammation.*—Generally comes on during the earlier exacerbations, and may be diagnosed by the intense headache, heat of scalp, flushing of the face, injection of conjunctivæ, and mental incoherence, gradually passing into drowsiness, coma, and death. The delirium will vary in character, according in its activity with the stenic condition, or otherwise, of the patient.

4. *Thoracic Congestion or Inflammation.* — This does not so frequently occur to Europeans as to natives of India, in whom symptoms indicative of pneumonia and bronchitis are commonly met with.

5. *Abdominal Complications.*— The abdomen generally, particularly the epigastrium, will be found tender on pressure, and this complication has been termed gastric remittent. Morbid accumulations in the large intestines give rise to irritation, frequently excite diarrhœa, and in a less number of instances dysentery. The liver is very frequently more or less implicated, evidenced by the jaundiced condition so often prevailing, and by the tenderness along the margin of the right ribs. Both liver and spleen are often felt to be enlarged.

6. *Inflammatory Remittent Fever.*—This does not imply the presence of local inflammation, but is applicable to the disease occurring in robust Euro-

peans lately arrived in India, and in whom the febrile exacerbation is found in a very aggravated degree.

7. *Adynamic Remittent.*—This implies a debilitated constitution, exacerbations less intense; the remissions imperfect; in fact, all the symptoms less active; muttering delirium, stupor and coma, being the rapid result.

8. *Remittent, complicated with Delirium Tremens.*—When the symptoms of remittent fever and the excitement induced by intemperance are attentively considered, it will be evident how the two occurring in the same individual at one time must render the diagnosis obscure. The history of the case is the best guide as to whether head-symptoms are chiefly due to remittent or "*e potû.*" The inflammatory form of remittent, occurring as it does in plethoric newly arrived individuals, is often seen associated with delirium tremens, in consequence of this class (particularly soldiers and sailors) not attending to the ordinary rules of health, relying on their constitution and strength, and continuing the same, or adopting even a more indulgent mode of living, although landed in a climate so different to what they have previously been habituated. In the same manner the symptoms of disease, in natives of India, are very frequently masked by the narcotic compounds they so freely consume.

Post-mortem appearances.—Serous effusion in the ventricle and between the membranes. Redness, ecchymosis, or even ulcerated spots in the large and small intestines; enlargement and softening of the liver, gall-ducts, and mesentery. In protracted cases, enlarged spleen, which has occasionally been found ruptured.

As before stated, this fever will not arise unless certain circumstances combine, giving rise to what we call malaria, which exerts a poisonous influence on the blood, and manifests its presence by inducing periodical phenomena. Although we cannot collect malaria as we can carbonic acid or hydrogen gas,

still, like electricity, we can foretell its presence under certain given circumstances, and, moreover, are able to state its certain effects in the same manner as we acknowledge the results of the three former agents.

Treatment.—In an ordinary case, where no complication exists, a mercurial purgative, as six grains of Calomel, should be given at once, followed by Sulphate of Soda or the compound jalap powder. This should be repeated daily until the alvine evacuations are of natural colour, while diaphoretics and diuretics will be demanded to soften the skin and increase the flow of urine. Headache may be relieved by a few leeches to the temples, and evaporating lotions and tepid sponging will often prove most grateful. During the exacerbation, the patient should be encouraged to follow the example of the natives, and drink plentifully of cold water, soda water, or other preparation.

Emetics are sometimes advisable if the patient is seen before the attack is fully formed, or during the premonitory symptoms, particularly if a foul tongue and nausea with attempts to vomit are present. Epigastric tenderness and the full formation of the paroxysm contra-indicate their employment.

Immediately on the first sign of remission, Quinine must be administered; the first dose of eight or ten grains, and a repetition every hour, or every second hour, of smaller quantities. Should the exacerbation not recur, the Quinine must be gradually diminished.

In cases where complications exist, abdominal, cerebral, or thoracic, the same plan must be pursued for the cure of the fever; but the inflammation or congestion present must also be treated; and here, in some instances, the specific effect of Mercury becomes a "remedy of necessity." It should be given in the usual frequently repeated doses, combined with Hyoscyamus or a small amount of Opium; the Quinine being likewise exhibited. Local depletion may also be practised, while cold to the head, warm fomentations, blisters, or sinapisms must be employed

according to the judgment of the attending practitioner.

It is impossible, in a work of this size, to lay down rules of treatment for every one of the multifarious complications found existing in praetice. The advisability of stimulants in typhoid or adynamie conditions—the propriety, or the reverse, of aetive depletion in eerebral complieations and in the inflammatory type—how far depletion or stimulants may be required when the disease exists with delirium tremens,—all these are questions which can only be rightly answered at the bedside, after attentive and conseientious consideration of the symptoms presenting.

During remittent fever, the exhibition of Opium, either alone or in combination, must be eonducted with the greatest caution. After repeated paroxysms, where no eerebral determination exists, when there is restlessness and want of sleep, and if the pulse is uniformly soft, Muriate of Morphia, in one-grain doses at night, will frequently produce a tranquillizing effect, and tend to delay the return of the paroxysm.

Stimulants, as wine and brandy, are generally required, and should be given in eombination with good animal broth or farinaeeous food, whichever the patient appears best able to relish.

For the cure of remittent fever, the specifie action of Mercury is not required, neither can general bloodletting be requisite. The disease is essentially a debilitating one; and although eminent men have sanctioned both praetices, still the emulgent aetion of Mercury and the employment of local depletion will afford all the benefit which can be expeeted from these agents.

It cannot be readily conceived how the specific action of Calomel is to benefit an uncomplicated case; neither have I seen instances, excepting, perhaps, when serving in the Indian navy, in the person of a latterly arrived robust European, where bloodletting appeared even admissible: and although these opinions

differ from the rules laid down by a high authority, * still I am supported in their expression by the testimony of a later writer.†

CHAPTER III.

INTERMITTENT FEVER.

In cold climates most authorities (among whom may be mentioned Drs. Copeland and Watson) agree that the tertian type of intermittent fever is the most common. Annesley‡ and Martin § also state that the same form is most prevalent in India; but, according to the observations of Morehead,‖ of Day,¶ of Waring,** of Macpherson,†† of Ewart,‡‡ and according to my own experience, the quotidian type is the more generally met with, both amongst Europeans and natives, in the Bombay and other presidencies. The quartan type is certainly less seldom seen than either.

There is, however, in India not only every variety, but also every degree of intensity. Of the numerous varieties, those forms known as the tertiana duplex and tertiana spuria appear to be the most common; the former only differing from the quotidian in that its paroxysms do not answer to each other singly, but alternately, the first fit coming on in the forenoon,

* Martin, 'On Tropical Climates,' pp. 161-171.
† Morehead's 'Clinical Researches,' pp. 199-206, vol. i.
‡ Annesley, 'On the Diseases of India,' p. 524.
§ Martin, 'On Tropical Climates,' p. 188.
‖ Morehead, 'Clinical Researches,' p. 22, vol. i.
¶ Day, "On Fevers," 'Ind. An. Med. Sci.,' vol. vi.
** Waring, ibid., vol. vi.
†† Macpherson, ibid., vol. vi.
‡‡ Ewart, "Vital Statistics of Kerwarrah Bheet Corp.," ibid., vol. xii.

the second in the afternoon, the third in the forenoon, and the fourth in the afternoon; and the latter having paroxysms of longer duration than twelve hours, and consequently inclining to the quotidian also. It very frequently happens, however, that intermittent fever in this country, particularly if unchecked by remedies, assumes so irregular and frequent a form as to be scarcely reducible to either of the different modifications.

Causes.—Intermittent fever is most prevalent in the same localities as remittent. Its causes are essentially the same, perhaps acting in a minor degree; and, indeed, it is often a sequel of that disease. Quotidians are general during June, October, and the intervening months, especially in that part of the country over which the rains of the south-west monsoon extend, and during which period the formation of malaria may be presumed to be most active. Tertians, on the contrary, are oftener seen during the colder months, and the tendency to an irregular type is more remarkable in localities where the sources of malaria are most abundant. The scorbutic diathesis is also a powerful predisposing cause.

Symptoms.—Like those of the kindred affection, the symptoms are divisible into the hot, cold, and relaxed stage, but of course differing in the complete intermission which occurs between the paroxysms. The cold stage, which may or may not be strongly marked, is characterised by languid circulation, feeble action of the heart; and hence tendency to congestions of internal organs. There is frequently drowsiness, headache, tinnitus aurium, precordial oppression, and sighing or hurried respiration. The pulse is feeble, skin pale and corrugated, and features contracted. Occasionally sickness, vomiting, and copious alvine evacuations. This stage may last from a few minutes to three hours and upwards, a protracted cold stage adding much to the danger of the disease, from risk of lesion of abdominal viscera, then so greatly to be dreaded.

The hot stage is characterised by the gradual return of the bodily heat, until the skin becomes dry and burning, the face flushed, and the conjunctivæ injected. There is frequently acute pain in the head, and the pulse becomes quick, full, and hard. This stage may last several hours, and is more strongly marked in the sthenic and robust than in the debilitated and anæmic.

At length the sweating stage commences by exudation of moisture about the face and neck, which soon becomes universal. The pulse lowers to its natural standard, respiration becomes tranquil, a feeling of exquisite comfort is experienced, and the patient, in an uncomplicated case, is restored to health.

The tongue is very frequently clean during the whole paroxysm, becoming furred in the intervals. Urine, if passed during the first stage, is pale and limpid, becoming scanty and high coloured during the season of heat, and copious with lithatic deposit at the termination of the paroxysm, without, as stated by Dr. Burdel, containing sugar. The average duration of the paroxysm is from six to twelve hours.

Complications.—1. *Intermittent tending to become remittent.*—This is one of those irregular forms of the disease where the intermission cannot be clearly diagnosed, and the symptoms become those of remittent fever.

2. *Sudden Syncope.*—This is not so frequently observed as a result of intermittent as of remittent; but nevertheless it sometimes occurs, and this possibility must be held in mind, and the patient in a debilitated and asthenic condition cautioned against sudden exertion and the upright posture.

3. *Cerebral Irritation* is frequently observed, both during the cold and hot stages, both in a sthenic and asthenic condition of system. In the former state, the cerebral symptoms occur during the earlier part of the hot or during the cold stage; in the latter, more towards the termination of the hot fit, and then may be regarded as an indication of exhaustion.

These head-symptoms are of different degrees of intensity, from slight incoherence to complete or violent delirium. In the majority of cases the patient is easily controlled, has occasional lucid intervals, may be roused by loud talking, and has a tremulous condition of the muscles, his state bearing considerable resemblance to delirium tremens.

4. *Typhoid condition.* — The former state frequently results in the establishment of the typhoid condition, marked by low, muttering delirium, dry, dark-coloured tongue, sordes, subsultus tendinum, dorsal decubitus, feeble pulse, retention of urine, and involuntary evacuations, and perhaps rose-coloured petechiæ.

5. *Convulsions, or rigid Spasm.* — These phenomena are occasionally observed either combined with the three last complications, or occurring without those conditions being present. They most frequently appear about the termination of the hot stage.

6. *Hepatic disease* may be either inflammatory or simply congestive; or enlargement of the liver may take place very gradually, consequent on repeated attacks of fever, without any decided symptoms of either of the former states having been observed. As either of these three conditions prevails, the symptoms will be more or less uneasiness, tenderness, or pain in the right hypochondrium, less being present when passive enlargement of the liver takes place.

7. *Enlarged Spleen.* — This sometimes occurs suddenly during the progress of fever, and is then attended with considerable pain and tenderness over the organ; but enlarged spleen chiefly occurs gradually, and is always associated with an anæmic condition. The enlargement may be so slight as to be scarcely recognisable, or the organ may extend inwards to the umbilicus, downwards to the ilium, or upwards to the heart, causing præcordial dulness. Laceration and rupture have been occasionally noticed.

8. *Dysentery and Diarrhœa.* — These diseases are sometimes concomitant with intermittent fever, but more frequently are the direct results of the conditions of liver and spleen just referred to. Diarrhœa also frequently occurs as a direct result of malaria, and may alternate with febrile paroxysms.

9. *Jaundice* may occur without any appreciable hepatic disorder; but it is to be presumed that when this condition exists, it can only do so as the effect of some functional or other derangement of the liver. Jaundice is, however, observed more frequently during the progress of remittent than of intermittent.

10. *Gastric Irritation and Dyspepsia.* — More or less dyspeptic symptoms exist in most cases of intermittent, and may be of varied degrees of intensity; worse in those instances where repetition of fever has established cachexia. The symptoms mostly present are—tongue furred in the centre, and red at the tip and edges; acid eructations; diarrhœa; epigastric tenderness; and loss of appetite.

11. *Thoracic complications* are frequently met with among natives, particularly in the cold weather of the northern provinces.

12. *Rheumatism.*—This, in a sub-acute and chronic form, is a very frequent complication with natives. The parts affected are chiefly the lower extremities and muscles of the loins, and the attempt to cure a bad case is next to hopeless. As with thoracic disorders, the cold of the winter season in the northern districts is most productive of rheumatism, although, indeed, residence in the south does not entail exemption. Although so many suffer from muscular rheumatism during the course of intermittents, endocarditis or pericarditis is comparatively very rarely observed as a concomitant.

13. *Neuralgic pain.* — This occasionally occurs, and may affect the infra-orbital, supra-orbital, sciatic, or other nerves; it also is sometimes found alternating with the paroxysm, and at others appears to occupy the place of the cold or cold-and-hot

stages, disappearing on the formation of cutaneous exudation.

14. *Scurvy*, showing its presence in the blood by the spongy gums.

POST-MORTEM APPEARANCES.—Death seldom, if ever, takes place from simple uncomplicated intermittent fever, and therefore the complications existing are the agencies producing the pathological conditions which are noted under the respective diseases of different organs.

The agent which we call malaria, arising, as a matter of course, under certain given circumstances in the poisonous origin of this variety of fever, acting in a more concentrated form, or on a more debilitated constitution, remittent fever would be induced.

TREATMENT, in uncomplicated intermittent, consists in endeavouring to shorten the first stage, and in using means to prevent the accession. If the patient is seen before the former is perfectly established, and if the tongue is foul, the stomach loaded, and the constitution good, an emetic may often be given with advantage; but when rigors have fully formed, warmth, warm drinks, heat to the extremities, and, if depression is great, diffusible stimulants are alone indicated.

When the hot stage commences, if pain or uneasiness evidence any tendency to local congestion, a mercurial purgative is desirable; but the practice of administering purgatives at this period in all cases is highly objectionable. Their operation disturbs and inconveniences the patient, and moreover exposes him to cold at the critical period of the desired intermission. Diaphoretics and diuretics should, however, be exhibited, while warmth must be gradually removed, tepid sponging employed, and exudation encouraged. Rapid evaporation must be guarded against, as liable to induce cold and congestions. Animal broths may be always offered, and, if depression is great, stimulants are called for.

If the patient is prescribed for after the paroxysm, as at the morning visit, five grains of Quinine, and

three or four drachms of Sulphate of Soda or Magnesia, to be followed at middle day by a repetition of the alkaloid alone, is good practice. The combination of Quinine and salts is very efficacious, and the mode of treatment just indicated may be advantageously pursued in most cases of simple intermittent, the second dose of Quinine being of course omitted if an accession occurs.

If during the paroxysm great pain of head is experienced, it will be best relieved by the cautious application of a few leeches; but as in remittent, so in intermittent, we are combating a disease of debility, neither depletion nor purgation must be carried to excess. During the paroxysm, as above recommended, or otherwise in the intervening period, the latter is generally required; but when the alvine evacuations become a natural colour, and the tongue is *cleaning*, purgatives must not be persisted in. The state of the tongue in this disease is not so much a guide to treatment as in many others, for the foulness is in most instances produced by the fever. Hence examination of the alvine discharges should always be instituted, and purgatives should never be continued with the view of cleaning the tongue; such treatment, there is good reason for stating, tends to induce dysentery or diarrhœa, contributes to the development of gastric irritation, aids to the induction of debility, and thus generates that cachectic condition so favorable to the recurrence of the fever.

At the earliest intermission, Quinine must be administered, in the first instance, perhaps, combined with a neutral salt, and afterwards alone.

I agree with M. Brequet, Drs. Bence Jones, Morehead, and others, that Quinine should be given in smaller doses frequently repeated, rather than in one large dose, either before the expected paroxysm or, as recommended by Dr. Mackinnon, Mr. Corbyn,* and Dr. Maltier, at the commencement of the sweating

* Corbyn's 'Annual Report of European Troops,' 1851-2.

stage. Quinine in one large dose frequently causes deafness and singing in the ears, results which in my own person have become permanent. Synchronism, it is true, may be produced by small and frequently repeated doses, but this condition is not more necessary than the full specific action of Mercury and other medicines when given in other diseases. As when employing Mercury, we endeavour to limit its action on the threshold of its specific power, so should Quinine be given with the same end in view; and in head-complications especially, large doses of the alkaloid should be considered inadmissible. As regards the advantages of efficacy, economy, and less demand of hospital attendance, which are stated by Dr. Mackinnon as the results of the large-dose system, I have to observe that the two latter can only be of secondary importance in cantonments and civil practice, and that the former advantage has not been so clearly recognised by other observers. In practice there is found a very considerable difference respecting the amount of Quinine which individuals tolerate, and indeed demand, for the cure of their fever. In those of sanguine temperament, marked by the chestnut hair, the blue eye, the florid complexion, the soft thin skin, and the large blood-vessels, and in those of nervous temperament, distinguished by the small spare form, with soft and slender muscles, the delicate features, pale complexion, light eyes, and thin lips, a given quantity of Quinine will generally produce more effects than when administered to those of opposite habit. Again, a violent attack of fever will require a larger exhibition of the anti-periodic than one of a milder type. Hence the amount prescribed must depend upon the physician's view of each particular case—upon the character of the fever and the constitution of the patient. In concluding these remarks, I would caution against a too implicit faith in Quinine as an anti-periodic. A very short practice in the tropics will show how numerous are the cases of fever over which this preparation has little preventive con-

trol, and it is in some of these instances that Arsenic proves so beneficial.

Arsenic has been long used by the natives of India for the cure of fever, and, when Quinine fails, its trial should never be neglected. In many instances it will be found worthy of its name, the "tasteless ague-drop," and it appears to exert a particularly beneficial action over the fevers of natives. Latterly, Mr. Turner, of the Bombay service, brought forward a plan of treating intermittent fever by large doses of Liquor Arsenicalis, such as twenty minims every hour until two drachms may have been given. In a report made to the Director-General, after trial of this procedure in upwards of thirty cases, I came to the conclusion that large doses had no greater specific effect over fever than small, while they often produced epigastric heat, pain, tenderness, and vomiting or purging.

As Dr. Billing observes, I believe Arsenic exerts some emulgent action on the liver, and hence a portion of the good resulting from its employment. Of course, intestinal complications contra-indicate its exhibition.

It sometimes happens that a case of intermittent occurs, over which neither Quinine nor Arsenic exerts a beneficial effect. In such cases Opium given in the form of tincture, in doses of 30, 40, or 50 drops an hour before the expected paroxysm, will sometimes prevent the access, and particularly when natives are the patients so treated. Lind recommended the Opium to be given shortly after the commencement of the hot fit, and asserted that its effects are more uniform and constant in intermittent fever than in any other disease. Without endorsing this statement to its full extent, it is certain that we have in Opium an antiperiodic of very considerable power.

In the same manner a glass of hot spirits and water will sometimes prevent the expected paroxysm. I am acquainted with a gentleman who, deriving no benefit from Quinine, frequently has recourse successfully to this plan. The employment of alcohol as an abortive

agent in intermittent has also been latterly recommended by Dr. Jules Guyot.*

Other remedies presumed to have antiperiodic powers, as Bibeerine, Salicine, Nicotine,† Ilicin, Charcoal, Piperine,‡ &c., are inferior to the three great remedies, Quinine, Arsenic, and Opium, and their employment cannot be recommended either on the plea of efficacy or economy. These, with other indigenous tonics of India, can only be used as adjuvants after the disease has been checked by our more potent remedies.

The mercurial treatment is only mentioned to be condemned. I have frequently found a liniment of turpentine and chloroform, rubbed over the spine twice daily, as recommended by M. Aran,§ of great value, and tending to retard and prevent the paroxysm.

Cobweb has been lately brought forward by Mr. Donaldson,‖ Bengal service, as a remedy of great efficacy in intermittent. When residency surgeon at Bhooj, in 1860, I collected a large quantity of clean cobweb and prescribed it in the shape of pills. Although as much as forty or fifty grains were given in a day, I cannot say that any effect was produced. Cobweb was tried, and found wanting, a century or more since.

In treating intermittents with cerebral complications, such an amount of local bloodletting may be practised as the constitution, strength, and length of residence in India will justify. The cerebral irritation, however, must not be treated as though it existed *per se*, and independently of the fever; on the contrary, it must be recollected that the condition of brain is *temporary*

* Dr. Guyot, 'L'Union Médicale,' Sept. 11, 1860.

† Mr. Roots, "On Narcotine in Ague," 'Lancet,' Sept. 22, 1832.

‡ Dr. Hartle, "On Piperine," 'Ed. Med. Surg. Journ.,' Jan., 1841.

§ M. Aran, 'Bulletin de Thérapeutique,' July, 1852.

‖ Mr. Donaldson, 'Indian Lancet,' April 1, 1859.

congestion rather than permanent inflammation, and that depletion will only increase this congestion by adding to the debility produced by its cause. A few leeches to relieve urgent pain are admissible, but I cannot imagine even in asthenic Europeans that full bloodletting is ever advisable, notwithstanding the recommendation of Annesley and later writers. In head-complications Quinine must be administered with greater caution, otherwise it will add to the head-symptoms already present, and so further intricate the case. Arsenic may be safely given.

The complications of typhoid condition, sudden collapse, and convulsions can only be treated by the prompt exhibition of diffusible stimulants, and by the application of strong Ammonia to the nape of the neck and chest.

When hepatic complications are present (as in remittent) attempts to stop the paroxysm must not be desisted from, while at the same time the inflammatory or congestive condition present is treated by its appropriate local or constitutional remedies (see "Liver Disease"), always keeping in mind that the latter state does not exist *per se*, but is the result of, or at least concomitant with, a disease of debility in which depletion cannot be practised without danger of adding to cachexia.

The treatment of enlarged spleen in like manner resolves itself into the prevention of its cause, whether remittent or intermittent. Local uneasiness may be subdued by leeches, mild tonic purgatives, blisters or Iodine paint, while the Sesquichloride, the Sulphate, or better, the Iodide of Iron may be administered. It must be recollected that Mercury has no effect on an enlarged spleen.

The complications of jaundice, dysentery, diarrhœa, scurvy, dyspepsia, &c., must be treated with reference to their cause and to their specific symptoms.

Neuralgic pains can only be cured by the remedies already indicated, which retard and prevent the return

of the paroxysm. Local applications may be used, but are of little avail.

Rheumatism and thoracic affections, on the other hand, are not due to the morbific influences inducing the febrile excitement. They generally occur in the northern districts and cold season, and are due to exposure, chills, or atmospheric vicissitudes. They mu t therefore be treated on established principles, antiperiodics being given, and depletion avoided, under fear of adding to that cachexia always coexistent.

Hence, whatever may be the complication present, the prevention of the paroxysm is the ruling indication. Except perhaps in the instance of rheumatism, all local derangements are directly aggravated, during the period of febrile disturbance, by the rush of blood to the centres during the cold fit, and indirectly (together with rheumatism) by the deterioration of blood and cachexia which each successive paroxysm aids in producing.

Annesley long since observed, "Fevers are the prevalent diseases of warm climates;" and this assertion, although made many years back, is still applicable to the present period. Of European troops in the Bombay Presidency, 61·3 are annually affected with fever, and Dr. Leith's admirable classification of the causes of death in Bombay for the year 1858 shows 5946 from that disease alone. Under the influence of better sanitary arrangements than formerly existed, of improved habits of life, of the general use of antiscorbutics, and of the more scientific treatment of disease, and the use of Quinine, we do not now stand appalled at such sweeping epidemics as those recorded by Lind, Magennis, Curtis, Hamilton, or Clarke; the latter of whom states that, in 1770, 80,000 natives and 1500 Europeans died from fever in the city of Calcutta. Hence it is not too much to assert that, by the cultivation of sanitary science and medical hygiène, the mortality from preventible diseases will still further diminish; if not, it will be from neglect of those principles for the preservation of health which

have been more or less advocated by the followers of medicine from the time of Hippocrates to the present period.

CHAPTER IV.

MASKED MALARIOUS FEVER.

The condition I purpose describing under this head is one which does not appear to have been fully recognised by authors on tropical diseases, although numerous writers have vaguely referred to the state which is now described under a separate heading. Thus Watson* observes, "Sometimes there is no distinct stage at all; but the patient experiences frequent and irregular chills, is languid, uneasy, and depressed. This state is commonly known among the inhabitants of our fenny districts as the dumb or dead ague; the patient is said not to shake out." Again, a late writer † says, "Malaria may be so virulent as to kill almost at once, or, received into the body in less intensity, may cause slighter degrees of malarious fever." A third ‡ describes two kinds of fever, one carrying off its victims quickly, the other not killing, but gradually wasting the body; and all authorities allow the greater intensity of fever in those localities where abundant development of malaria takes place.

Masked malarious fever may be regarded as the manifestation of the presence of malaria in a minor degree

* Watson, 'Lectures on Physic,' vol. i, p. 725.

† Mr. Day, "On Tropical Fevers," 'Ind. An. Med. Sci.'

‡ "Reminiscences of Lahore," 'Indian Lancet,' Sept. 15, 1860.

of concentration, or acting upon a feeble or irritable constitution. It consists of febrile excitement, which may be remittent or intermittent, and may be often recognised as occurring to delicate females. The scorbutic diathesis is sometimes concomitant.

The individual thus affected complains chiefly of heat, dryness, and burning in the palms of the hands, and less frequently in the soles of the feet. There is more or less general uneasiness, perhaps slight evanescent headache, but no decided pain. The circulation is not excited. The appetite is unaffected, but the sleep is generally restless. The burning of the palms may be persistent, with slight remissions, when the parts become slightly moist, or there may be distinct intermissions. This condition frequently prevails for months or indeed years, and is oftentimes so slight as scarcely to attract the attention of the individual; but in other instances it constitutes a perpetual source of annoyance and discomfort. Persons so affected are especially prone to attacks of fully developed fever; but in some cases they appear to escape the latter, by the malaria expending itself in the constant induction of the masked form.

Treatment.—The treatment is readily deduced, and consists in attention to diet, the administration of Arsenic and Quinine, and the habitual use of coffee as a beverage. The latter has long enjoyed a questionable repute as an antiperiodic, and has been highly recommended as such by Nebelius and Baglavi, by M. Payen, Delioux, and others. As an adjuvant in the masked form of malarious fever, I entertain no doubt of its efficacy. Change of climate or locality is, however, the only certain cure.

CHAPTER V.

LEUCOCYTHÆMIA SPLENICA.

Enlargement of the spleen occurring during the progress of, or after, remittent or intermittent fever has already been noticed; but there is another condition of this organ, consisting in hypertrophy of its normal tissue, and not only associated with intense cachexia, but characterised by a peculiar pallor, and an excess of those white corpuscles in the blood first pointed out by Dr. Hughes Bennett, in 1845. This condition of splenic leucocythæmia and hypertrophy frequently occurs as a consequence of intermittent or remittent, or as a sequel of the engorgement of the spleen resulting from the cold stage of those diseases. But it also repeatedly develops as a generation or accompaniment of the last-described state—masked malarious fever. Indeed, splenic leucocythæmia has been known to arise without even this indistinct febrile condition having been noticed in individuals who have resided long in malarious localities.* The scorbutic diathesis is sometimes concomitant.

During the earlier progress of cases of enlarged spleen occurring after the fever, the condition of the organ is one of engorgement, distension, and congestion, rather than that of fibrinous deposit and hypertrophy of structure, although repetitions of the attack will surely lead to such changes. That this is the case appears clearly evidenced by the very rapid manner in which enlarged spleen disappears (not certainly, as a Parisian physician would have us believe, in a few minutes after the exhibition of Quinine, but) in the course of some days, when the increase of bulk is due to fever. When, however, the constituents of the blood

* 'Lancet,' "Mirror," Jan., 1860.

have become converted into tissue of low organization, or, in other words, into hypertrophy of the spleen, then the enlargement is permanent, or, at all events, can only be removed by the slow and gradual process of absorption.

The question now arises, Whether is this condition of spleen the consequence or the origin of the cachexia, and deteriorated blood coexistent? It has been thought, portions of "splenic pulp" or previously extravasated blood, changed in their nature, and unfit for their proper purposes, might find their way into the circulation, either through the splenic vein or lymphatics. This may probably be the case after extravasation occurring in the cold stage of ague; but when the latter has not taken place, when the spleen becomes enlarged without this prior occurrence, we are necessitated to believe that malarious influences produce that condition of blood which favours its stagnation and deposit in certain structures; and if it be true, as stated by Gray,* that the weight of the spleen increases considerably, and contains more blood during the digestive process, there is a natural congestion established from which the contaminated and poisoned blood cannot retire without leaving some of its constituents, in the shape of fibrinous deposits, in that organ.

And if, in addition to the "safety-valve" function, the spleen exerts an influence in common with the lymphatics or the assimilating process, and aids in rendering the crude materials fit to circulate in the blood,† we can easily understand how disease of this organ will react on the system. And if the white blood-cells have for their office the transformation of albumen into fibrine,‡ we can also readily imagine that, this process being checked in the spleen at least, the white corpuscles undisposed of may pass again

* Gray, 'On the Structure and Uses of the Spleen.'

† Carpenter's 'Physiology,' p. 294.

‡ 'Brit. and For. Med.-Ch. Rev.,' 1855; Carpenter's 'Phys.,' p. 125.

into the general circulation, and their excess become leucocythæmia splenica.

Symptoms.—It is this condition where, in addition to the physical signs of enlargement of the spleen, the dull expression, the anæmic countenance, the lemon-coloured or transparent conjunctivæ, the pale, tremulous, but coated tongue, the blanched lips, the occasional existence of systolic cardiac murmur, and the tendency to hæmorrhages evidence the deteriorated and the poisoned diathesis established.

Treatment. — The indication is to combat the cachectic condition; and as we are unable to remove its cause, this cannot be otherwise fulfilled than by transferring the patient from such influence, that is, by effecting a thorough change of climate; and this there should be no hesitation in recommending. If it cannot be obtained, a sea voyage, removal to another station, district, or even house, should be suggested. Medicinal treatment consists in tonics, as Quinine and Iron, and the tonic aperients of Twining and Shulbred, the chief constituents of which are Bitartrate of Potash, Sulphate of Iron, with Calumba. All depleting treatment, as repetition of leeches over the spleen, or the exhibition of purgative medicines, given with a view to reduce the size of the organ, are distinctly contra-indicated. The former only increase the general cachexia and debility, while the latter, in addition, are liable to excite dysentery. Mercury is also inadmissible, tending, as it does, to debilitating results. Iodine and Bromine, from which much might rationally have been expected, have not been found efficacious. Warm baths, medicated or otherwise, are useful adjuvants, particularly the Nitro-Muriatic formula, if there be any suspected liver affection. The application of blisters in the asthenic condition of leucocythæmia splenica is not advisable, and Twining's recommendation of acupuncture of the spleen cannot be entertained.

CHAPTER VI.

THE PREVENTION OF MALARIOUS FEVERS.

Avoidance of the localities mentioned as productive of malaria. If obliged to remain in or pass through such districts, avoidance of the night air, wearing a silk handkerchief round the mouth and nose, or better still, the charcoal respirator of Dr. Stenhouse. Fortifying the stomach by a cup of hot tea or coffee before going abroad in the morning. Keeping doors, windows, or tent purdahs closed (with due regard to ventilation) during the hours of sleep, and particularly those facing unhealthy localities. Occasional tobacco smoking. A moderate supply of beer and wine. Avoidance of unnecessary fatigue. The prophylactic use of Quinine. Sleeping in upper rooms. Taking care not to drink water from wells or pools in which leaves and other decaying matter may have fallen; or, if obliged to use such water, having it first boiled and filtered. Enforcement of general sanitary regulations. A due proportion of vegetable diet.

After attacks of fever, change of air should be insisted on. A very small distance may suffice—from one station to another, a short sea trip; or if these cannot be obtained, even the removal from one end of cantonment to the other, or to a different residence, is frequently very beneficial. Undrained houses, as well as undrained land, may be the cause of malarious disease, of which we have numerous proofs both in the eastern and western hemisphere.

CHAPTER VII.

ON THE INFLUENCE OF THE MOON ON THE MALARIOUS FEVERS OF INDIA.

It is supposed that there is an ebb and flow in the circulation, corresponding to the phases of the moon; the blood flowing more rapidly, and the vis vitæ being more stimulated, at the flood and full than at the ebb, when a reaction takes place proportionate to the previous excitation. In support of this theory, it has been noticed by Dr. Mead that most deaths occur at the ebb of the tide; and, indeed, this would appear to be an observation of no very recent date, as Shakspeare, who was almost as great a physician as poet, makes the death of Falstaff to take place "just at the turn of the tide."

Mr. Day,* in an able statistical paper on tropical fevers, arrives at the conclusion that the probabilities appear that there is a sub-lunar influence, which is greater at the equinoctial period than in the respective intervals. Martin† also mentions the influence of the moon as "very remarkable." Indeed, a very short practice in the tropics will convince the most sceptical, that individuals who have suffered from malarious fevers are more or less affected at either the full or change of the moon. Many experience return of fever at these times; others, feelings of uneasiness or *malaise*, but not amounting to actual ague; and this predisposition to become periodically affected may remain for months or even years, and may recur at uncertain periods, the intervals being passed in perfect health. That the moon, *per se*, has any effect in inducing this state may well be questioned; but that

* 'Indian An. Med. Science,' No. 10.
† 'Lancet,' July 26, 1851.

the amount of mud-surface exposed by the low ebb tides, and the consequent greater exhalation taking place, may act as an excitant, is at least probable in the neighbourhood of the sea-coasts. In far inland districts some other solution of the mystery is, however, requisite; and Morehead inclines to the opinion that, when the coincidence of febrile disease and lunar phases is noted, there will generally be found present an appreciable atmospheric change of temperature, of moisture, or of direction of winds, which he apprehends is the determining cause of the febrile disturbance.

CHAPTER VIII.

ELEPHANTIASIS.

Synonyms.—Elephantiasis Arabum; Bucnemia; Barbadoes leg, Cochin leg, Egyptian sarcocele.

Elephantiasis, whether affecting the genitals or limbs, is one and the same disease; and, if of long standing, its effects are not limited to external changes, but disease of internal organs will be found.* It may be defined as consisting, constitutionally, of a peculiar fever, returning at irregular intervals, and, locally, of hypertrophy of the skin and subjacent areolar tissue, due to adventitious deposits, accompanied with deterioration of blood and change of structure in internal organs, particularly the spleen.

Causes.—The causes of this disease have been the subject of much diversity of opinion, and its origin has long engaged the attention of medical men. The Hindu, Greek, and Arabian authors assign its production to tainted air, unwholesome diet, and, when attacking the genitals, to impure sexual intercourse,

* Dr. Webb, 'Ind. An. Med. Scien.,' vol. iv.

which, according to Dr. Webb,* is still a frequent cause of the latter form of the disease. The same author states† that there are two varieties, one syphilitic, and either hereditary or not, the other malarious, and connected with "moon fever;" and that the majority of cases affecting the scrotum are syphilitic. Dr. Waring‡ considers it due to the effects of malaria. Dr. Leslie§ holds the same opinion. Drs. Hillary and Musgrave, as quoted by Mr. Day,‖ refer it to fever; and the latter gentleman states, the accompanying fever frequently resembles the quotidian type. Hence, when it is recollected that the disease occurs chiefly in malarious localities, there can be little hesitation in arriving at the conclusion that malarious influences are the chief predisposing causes.

That syphilis, either hereditary or acquired, is a powerful agent in inducing predisposing cachexia, cannot for a moment be doubted; but that the two are separate forms of the same disease, is not so clear. Morehead ¶ observes, that the use of fermented toddy has been supposed favorable to its production, just as wine and beer are to that of gout; and it is not improbable that different kinds of diet may hereafter be found to have an influence in producing not only this disease, but also leprosy, in the same manner as the kessaree dal grain has been proved to cause the loss of power in the lower extremities, or even perfect paraplegia,** in those obliged by the *res angustæ domi* to live on this material, or as diseased rye is known to cause mortification. It also appears more than probable the use of an inferior description or of diseased rice, or of a too general rice diet, has an effect in pre-

* Dr. Webb, 'Ind. An. Med. Scien.,' vol. iv.
† Ibid.
‡ Roy. Med. and Chirurg. Soc., paper "On Elephantiasis," by Dr. Webb, 'Lancet,' Dec. 22, 1860.
§ 'Report of Civil Dispensaries,' Madras, 1858, p. 94.
‖ 'Madras Med. Journal,' No. 1, "On Elephantiasis."
¶ 'Clinical Researches,' vol. ii, p. 678.
** Dr. Irving, 'Ind. An. Med. Sci.,' vol. xii.

disposing to this disease. In proof of this it may be stated, that elephantiasis is generally present in rice-producing countries; and that an inhabitant of Bengal will, very likely, lose the disease if he go to the provinces of Upper India, and *vice versâ;* the diet of the inhabitants of the latter being wheaten bread, more than rice.*

Other causes which have been mentioned as inducing the disease are all those which must aid in the deterioration of blood and establishment of cachexia. These are the use of bad water, hard work, want of sleep, deficiency of food, exposure to cold and damp, skin diseases, ulcers, neglect of sanitary measures, and the scorbutic diathesis.

These are, however, together with hereditary taint and syphilis, either hereditary or acquired, merely to be regarded as predisposing causes, which would not induce the disease without the addition of malaria; and, although it has been asserted that the elephantoid fever is a result of the local affection, and that the local affection is the result of inflammation of the veins,† still the facts, that the disease abounds in malarious localities, such as rice-producing countries—that the fever is observed prior to local swelling, and has an intermitting character‡—that, as Waring observes, the rule is, no fever, no enlargement§—that antiperiodics are efficacious remedies‖—that spleen disease is frequently found associated,¶ and that the condition noticed as splenic leucocythæmia coexists, scarcely leave room for doubt that malarious influences are the *fons et origo mali.*

That Europeans are so seldom affected with the disease does not destroy the foregoing conclusion. They

* Dr. Webb, 'Ind. An. Med. Sci.,' vol. iv.
† Dr. Wise, 'Trans. Med. and Phys. Soc.,' Calcutta, vol. iii, p. 178.
‡ Mr. Day, "On Elephantiasis," 'Madras Med. Journ.,' No. 1.
§ Mr. Waring, 'Ind. An. Med. Sci.,' No. ix, p. 14.
‖ Ibid.
¶ Dr. Webb, 'Ind. An. Med. Sci.,' vol. iv.

are not reared in the country and exposed, from the days of their youth upwards, to subtle malarious agencies; they are better fed, nourished, and cared for, in a sanitary point, than any of the lower classes of natives, among whom the disease principally prevails; and, moreover, they do not remain in the country, the majority being invalided, or dying of some more acute disease, before elephantiasis has time to develop itself. The better class of natives are remarkably free from elephantoid disease.

A case, brought before the Roy. Med. and Chirurg. Soc. by Dr. Richardson, of a girl born in England, and afflicted with elephantiasis, but whose father had previous to her birth been in the West Indies for years, appears to favour the view of hereditary transmission.

Elephantiasis is frequently seen in the Bombay Presidency, but is much more common in Madras and Bengal. In Cochin, Mr. Day states, about one in seventeen of the native Christians are affected, and of the Portuguese about one in eighteen. In all localities it is more prevalent in low, damp situations near the sea, or in the neighbourhood of marshes, or in any place where tainted, malarious atmosphere might be expected.

Symptoms.—The parts affected locally are, as regards frequency, the lower extremities, the scrotum and penis, the labia pudendi, the mammæ, and, lastly, the upper extremities. It may occur in childhood or in very old age. It more frequently affects men than females,* in the proportion of three and a half to one; and the period between thirty-six to forty years is the time when the former suffer most from the disease. Coolies or labourers are more subject to it than any other class. The developed attack consists of constitutional and local symptoms; but the former may endure for a length of time without evidence of

* Mr. Waring, "On Elephantiasis," 'Ind. An. Med. Sci.,' vol. ix.

the latter. Elephantoid fever has a distinct intermitting or remitting character, and during its paroxysms an enlarged and painful gland almost invariably exists in some portion of the affected limb, between the site of the following effusion and the patient's body. Thus, when the limbs are affected, the enlarged gland may be in the flexure of the knee or arm, or, as more frequently occurs, in the axilla or groin: then a reddish or dusky line forms in the course of the absorbents, succeeded after an interval by redness, heat, and swelling of the surrounding parts, with tenderness and enlargements of the neighbouring lymphatics and veins. This subsides in the course of a few days, leaving some amount of thickening and hardness. At this period, a reddish or dusky line, having a cord-like feel, may generally be perceived along the course of the absorbents, between the local effusions and the enlarged glands. At irregular intervals, the fever, often marked by the well-known cold, hot, and sweating stages, recurs with attendant or following hyperæmic action in the part locally affected, until, ultimately, the latter becomes of enormous weight and size. The swelling may also alternately enlarge and decrease; and it is often larger in the afternoon than in the morning, which is accounted for without difficulty. Headache, more especially in the occipital region, and constipation generally attend the elephantoid fever.

The surface of the swelling is always latterly rough, reddened, or livid, or of a dark Indian-ink colour, often cracked or fissured, and exhaling a fetid, serous, or bloody discharge. Sometimes there are scaly excrescences, resembling psoriasis, soft fungous granulations, or ulcerated spots, while in almost every case enlarged veins traverse the surface. As the disease advances, suppuration, both deep seated and superficial, occurs, from which the patient sinks exhausted after a longer or shorter period. The duration of the disease is from a few months to many years.

In the West Indies the leg is chiefly affected, hence

the term Barbadoes leg ;* but among the Eastern races it is particularly liable to attack the scrotum, which is converted into a large tumour, reaching to the knees or ankles, and known to weigh upwards of 180 lbs. Here the malady generally commences in the prepuce, but, ultimately, the whole of the penis and scrotum become implicated, and the former organ and the testicles become lost in the mass. Now and then this form has also been observed in Europeans. When it occurs in the leg it resembles, in some respects, *phlegmasia alba dolens*, and it sometimes extends to the thigh or even the whole body.†

Post-mortem appearances.—The post-mortem appearances, both microscopical and otherwise, have been well described by Allan Webb,‡ the latter consisting mainly of overgrowing fibro-cellular tissue, mingled with elastic tissue and more or less fat, interlaced with strong shining bands ; this description agreeing in all essentials with that of Paget,§ in his 'Surgical Pathology.' Microscopical research has added little to our knowledge of the pathology and treatment of the affection. Diseases of the spleen, as softening and enlargement, and also of the mesenteric glands, are frequently observed. The liver and heart have occasionally been found large.

The disease cannot be considered as otherwise than a blood-disease, arising in the first instance from malarious influences, and aided by the other causes named, as syphilis, poor diet, &c., which leads to febrile disturbance ; eventually, from some hidden cause, becoming localized in particular parts.

Treatment.—In the earlier stages the disease may be somewhat controlled by the exhibition of anti-periodics, as Quinine and Arsenic, and by tonics, as Iron and Steel. Eliminatives, purgatives, diaphoretics, and diuretics are occasionally of use. Leeches, bandaging,

* Mr. Dalton, "On Barbadoes Leg," 'Lancet,' vol. ii, 1846.
† Mr. Day, 'Madras Med. Journal,' vol. ii.
‡ Dr. Webb, 'Ind. An. Med. Sci.,' vol. iv.
§ Paget, 'Surg. Pathology,' vol. ii, p. 105.

frictions, with Iodine Ointment, Biniodide of Mercury Ointment, and other discutients, may also be used. Iodine may be also administered internally; and a small issue has been proposed. When the limb has become an useless incumbrance, and the general health has not very materially suffered, the question of amputation may be entertained. Successful cases are reported by Mr. Day, of the Madras service.

Successful operations for scrotal elephantiasis have been performed by Delpech, Liston, and Larry, in Europe; by Clot Bey in Egypt; and by Esdaile, Allan Webb, Shircore, Brett, Ballingall, Cleveland, and others, in India; but the excessive hæmorrhage which takes place must always render this a dangerous proceeding. Should, however, a patient desire to be relieved of his incumbrance, and if the evidences of exhaustion are not so strongly marked as to forbid reasonable hope of recovery (as is the case with a patient under my care at the present time), the operation may be undertaken. If such be decided, the enlargement should be compressed, so as to enforce the escape of every drop of blood into the general circulation; the groins should be examined for herniæ, the tumour raised by assistants or a pulley, and a longitudinal cut made over the dorsum of the penis, which should be dissected out. The testicles, which are often atrophied or calcareous, should be sought for and gently disentangled, after which the remainder of the tumour may be cut away with a long catlin. All arteries must be immediately ligatured, and brandy, cordials, and laudanum must be at hand to guard against syncope and diminish shock to the system.

That the penis and testicles may sometimes be saved there is evidence in the report of an interesting case by Dr. Cleveland, where these organs cicatrized over, and procreative power was regained; but if the tumour be very large, and the penis and testicles lost in its substance, the attempt to save them will often not

* Dr. Cleveland, 'Madras Med. Journ.,' Vol. i.

succeed; the hæmorrhage cannot be controlled, the parts will not granulate, or they may slough away. Under such circumstances, we have a recommendation to make a clean sweep and remove the whole.*

In all cases of this disease, to obviate any scorbutic deterioration, a due proportion of anti-scorbutic vegetables should form portion of the diet.

CHAPTER IX.

LEPROSY.

SYNONYMS. — Lepra tuberculosa; Elephantiasis Græcorum; Lepra Ægyptica; Lepra Arabum; Lepra Helneorum; Vitiligo alba; L. Leontina; Leontiasis; Satyriasis.

IN its endemic distribution, this malady corresponds, as regards its greatest intensity, with the belt of maximum heat of the globe. It chiefly affects the Hindoos, Mahommedans, Africans, and Chinese living within or on the borders of the tropics. It prevails in a less inveterate form in Spain and the Mediterranean coasts, but also occurs in Greenland, Norway, Iceland, and Lapland.† Cases also of the disease have been treated by Mr. Syme and Dr. Simpson in Edinburgh, and by Dr. Addison at Guy's; the last-mentioned patient having never been out of England. It may, however, be doubted if the cases of so-called leprosy observed in cold climates is the same inveterate disease we observe in the East. Dr. Hobson states, that the Chinese consider a visit to the North a certain cure for leprosy.

* Dr. Webb, 'Field-Notes for Amputations.'

† 'Trans. of Geograph. Soc.,' "Dist. of Health and Disease," by Mr. Johnstone.

Causes.—The causes of this disease are obscure, and the pathology does not materially assist in their elucidation. Hereditary taint has been named, but in the majority of instances this is absent.* Scrofula has been supposed to excite it, but certainly this is seldom the case in India.† There is no good evidence, as asserted by Mr. Coote, that the disease is infectious. In India, as long as the leper can work he is no outcast from society; his fellows live in the same house, partake of the same food, and even allow him to marry. Syphilis will, undoubtedly, prepare the system for leprosy. Moreover, it frequently coexists, and then the disease is rightly called syphilitic leprosy; but that syphilis is either the parent or offspring of leprosy, or that the latter was ever a constitutional form of the former, as Simon and Lindworm, of Hamburg, would have us believe, may well be doubted. Whatever induces cachexia, as defective diet, poverty, filth, damp, scurvy, impure water, and exposure, will, like syphilis, predispose to leprosy; which, however, appears to require the specific cause of malarious influence to develop the disease in the inveterate form which is endemic in the East.

Almost the same arguments which have been applied to prove the malarious origin of elephantiasis may be again brought forward, for the same reason, as regards the kindred disease, leprosy.

It is a very common affection among the lower classes of Indians, so much so, that leper hospitals have been established in Madras and Calcutta; since 1728, at Cochin; and a ward is allotted to the disease in the Jamsetjee Hospital, in Bombay. Europeans are also occasionally affected by it; why not oftener, may be answered in the same manner as their exemption from elephantiasis is accounted for.

Symptoms.—Like elephantiasis, leprosy is frequently preceded by constitutional symptoms, the chief being

* Dr. Hobson, "On the Leprosy of the Chinese," 'Med Times,' June 2, 1860.

† Day, "On Leprosy," 'Madras Med. Journal,' No. 2.

elephantoid fever and dyspepsia. As described by Wilson,* there are two varieties; first, lepra tuberculosa; second, lepra anæsthesiaca. Both forms occur, for the most part, in the middle period of life, and are more frequently oberved in males. Tubercular leprosy comes on gradually, with loss of sensibility, discoloration of the skin, deficient perspiration, coldness of the part, and, after a variable period, various patches on the face or extremities, presenting a livid, shining appearance. Sometimes these patches are bronzed, dark, and raised, possess exalted sensibility, and gradually become numbed. After a longer or shorter period of weeks, months, or years, the integument becomes thickened, tuberculated, and darker, and may be mistaken for syphilis. The prominences vary from the size of a pin's head to that of a walnut, and the face or part affected presents a curious tuberculated appearance. Sometimes the fingers are first attacked, and the nails become black, shell off, and leave unhealthy ulcers. The disease may now remain stationary for an indefinite period; but ultimately the tubercles suppurate, and frequently the fingers and toes become contracted, or are totally lost from sloughing ulceration. The mucous membranes also become attacked; hæmorrhages from the nose and mouth frequently occur, and there is considerable thickening, tubercular deposit, or ulceration apparent in those parts, followed by destruction of bones, not unlike the ravages of tertiary syphilis. The fatal termination is generally by lung or bowel affection, or the patient sinks exhausted with preceding delirium.

The anæsthetic variety commences with loss of feeling, white patches of discoloration, into which the colour gradually fades; falling off of the hair and watery bullæ, which are suddenly and painlessly developed. These burst in two or three days, leaving an oval or round ulcer, which eats slowly downwards,

* Wilson, "On Leprosy, Ancient and Modern," 'Lancet,' Jan., 1856.

sometimes destroying the bones beneath, at others healing with a white depressed cicatrix. As the disease advances, great atrophy ensues, the toes and fingers become swollen, and afterwards shrink, leaving the joints prominent (elephantiasis nodosa), and ulcers form about the articulations; the throat becomes implicated, the nose attacked, and, as in the other variety, the fingers and toes become contracted, then slough off. Occasionally the ulcers appear to have an internal origin, commencing by absorption of articulating processes, which may end in anchylosis. As in the tubercular leprosy, the fatal termination is by lung-affection, diarrhœa, melæna, dysentery, or exhaustion. Both forms are accompanied by urgent dyspepsia, and, in some instances, the insensibility of the surface is so great that flame will not produce pain.

According to Dr. Webster,* lepers are almost invariably happy and contented. This gentleman, however, observed the disease in Granada, and his conclusions do not agree with those of Indian authors. Here the lepers become morose, inclined to brood in solitude, drink spirits, eat opium, and smoke gungah; in fact, appear to endeavour to shun a sense of their unfortunate condition.

It is a curious fact, that wounds heal remarkably quickly in the leper. This was lately exemplified in the person of a farrier, who had his testicles and penis bitten severely by a horse. Psoriasis and itch are frequently co-existent with leprosy.

The average duration of the disease is, according to Boek† and Danielssen, eighteen years and a half, but in India it would appear to run a much quicker course.

Post-mortem appearances. — Lungs often diseased, with tubercular deposits. Liver and spleen generally enlarged and softened. Deposits about the

* Webster, "Notes of a Visit to the Leper Hospital, Granada," 'Lancet,' Jan. 21, 1860.

† 'Report to the Norwegian Government on Elephantiasis des Grecs.

spinal cord, which has been found hardened. Thickening and deposit about the membranes of the hair.

Leprosy appears to be fairly reducible to the catalogue of endemic malarious diseases; but why in one case this affection, and in another elephantiasis, arises, is a mystery not likely to be solved; and the same must be stated regarding the peculiar deterioration of blood which induces either one or the other variety. Leprosy and elephantiasis must be considered as allied diseases, with this difference, that in the former, as stated by Morehead,* there is more general and extensive exudation deposit, and a greater deviation in it from the blood-plasma, as is shown by its readiness to undergo softening, ulceration, or gangrene. The diagnosis between the two diseases and from syphilis has been sufficiently indicated in the text.

Treatment.—This is vague and uncertain. Arsenic, Quinine, and Iron, combined with generous diet, seem to have most effect on the disease, by strengthening the constitution. Medicated baths of various descriptions have been much recommended. The ulcers and sores require chiefly stimulating applications. Amputation, except for the removal of sphacelating parts, is inadmissible, as the disease returns in the stump. The diet should contain a due proportion of fresh vegetable material.

* 'Clinical Researches,' vol. ii, p. 678.

Section II.—Diseases depending on Heat as a chief cause.

CHAPTER I.

ARDENT CONTINUED FEVER OF INDIA

Is characterised by intense morbid action, tending to rapid exhaustion; chiefly prevails in the months of April and May, and in localities where the temperature is more than commonly elevated. It has, by some authorities, been regarded as a minor degree of insolation or sun-stroke.

Symptoms.—The attack is generally sudden, with sometimes premonitory chills. Dr. Arnott* has thus described ardent fever:—"Pungent heat of skin; great thirst; parched, red, and dry tongue; quick, full, and strong pulse; racking pains in different parts of the body; acute headache, with flushed countenance; throbbing of the temples; restlessness, nausea, and vomiting of bilious matters." The duration of the disease is about sixty-hours; sooner or later, collapse comes on, with more or less of those signs to which "malignant" may be applied.

Complications.—Inflammatory and congestive conditions of the cranial and abdominal organs.

Post-mortem appearances.—Serous effusion in the ventricles and between membranes of the brain Turgescence of the vessels. Redness, ecchymosis softness, and the products of inflammation in the texture of the bowels and cavity of the peritoneum Softness and turgescence of the liver.

As Mr. Low† observes, the blood previously de

* 'Medical History of the Bombay Fusileers.'

† "History of B. Comp. Madras Sappers," 'Mad. Med. Journ. No. 3.

prived of its watery constituents by profuse transpiration, loaded with the carbonic acid of the system, is no longer able to carry on the supporting functions of life; the depressed nervous functions can no longer supply the stimulus needed, and congestions of a formidable character ensue. Mr. Day* considers the "nature of ardent fever very much the same as that of continued fever," called into being by great atmospheric heat.

Treatment.—Here there is no morbid material in the blood producing the debilitating effects of malaria; and energetic and decided treatment is imperatively demanded. This consists in general and local bloodletting, cold affusion, mercurial and other purgatives; but such means must be adopted at the commencement of the disease, or the rapidly increasing exhaustion will forbid their application. When the patient does not come under treatment till the powers of life are becoming exhausted, we must trust to restoratives, as Ammonia, wine, affusion, brandy, and Camphor, afterwards resorting to the use of tonics.

Particular congestions and inflammations must be combated by the application of leeches, the exhibition of Calomel with Opium, the use of hot poultices and fomentations, laxatives and diaphoretics.

CHAPTER II.

INSOLATION.

Synonyms.—Coup de soleil; heat-apoplexy; heat-asphyxia; Ictus solis; Cephalitis Ægyptiaca; Erythismus tropicus; Cerebral fever; Casus ab insolatione; Phrenitis Indica, &c.

The affections which have been generally described

* Day, "On Tropical Fevers," 'Ind. An. Med. Sci.,' No. 13.

under one or other of these terms, although due to the same causes, are characterised by different symptoms, and require distinct and dissimilar treatment.

Causes.—Malaria, fatigue, great excitement or depression, crowded barracks, hospitals, and ships, scorbutic taint, defective secretion, retained excretions, former attacks of the disease, natural irritability of disposition, former injuries of the head, anything tending to debilitate or contaminate the system, may be regarded as predisposing causes; while exposure to the direct rays of the sun, to great elevation of temperature and dry heat, rarefaction of air, and consequently diminished supply of oxygen, and evaporation of the watery particles of the blood, are the exciting. The latter causes, however, are quite sufficient to induce the disease, even when there exists no predisposition from the former.

When hot weather commences suddenly after cold, the affection is most prevalent. Also in "those calm sultry days when the sun is obscured by a film of clouds or impalpable dust."* It often prevails epidemically among Europeans in crowded barracks and hospitals, as was the case with H. M.'s 3rd Dragoons at Cawnpore, June, 1838;† with H. M.'s 19th Regiment at Barrackpore, May, 1858;‡ with the 3rd European Light Cavalry at Mean Mear, May, 1859;§ and in many other instances which might be quoted. Should any moisture occur in the atmosphere, the number and severity of the attacks begin to decrease;‖ and the advent of a hot wind after a sultry calm has been known to remove an epidemic.¶

As Dr. Morehead** observes, the synonyms above

* Gordon, 'Med. Times and Gazette,' Oct., 1857.
† Hill, "On Heat Apoplexy," 'Ind. An. Med. Sci.,' No. 5.
‡ Longmore, 'Lancet,' March, 1859.
§ Butler, 'Ind. An. Med. Sci.,' No. 12.
‖ Day, op. cit.
¶ Hill, op. cit, No. 5.
** Morehead, 'Clinical Researches,' vol. ii, p. 586.

noted, "so generally applied to head-symptoms with coma occurring in the hot months of the year, tend to perpetuate error," the states in question being not unfrequently produced by high temperature without direct exposure to the sun. The varieties of the disease which a consideration of the etiology, pathology, and symptoms have induced me to distinguish are as follows, and practically they are found to be correct:

1. Insolation, coup de soleil, or heat-apoplexy, due to the direct rays of the sun.

2. Heat-apoplexy due to direct rays or elevated temperature.

3. Heat-asphyxia occurring both from direct exposure and elevated temperature.

4. Cerebral fever, also caused by direct and indirect heat.

1. INSOLATION; COUP DE SOLEIL; HEAT-APOPLEXY.—Here the symptoms, when truly developed, are those of true apoplexy or coma, and they may come on without any premonitory warning.* In by far the most cases, however, there is a preliminary period of faintness, sickness, confusion of ideas and vision, drowsiness, headache, shivering, loquacity, hysterical fits of laughing and crying,† and irritability of the bladder,‡ which in a few minutes or hours terminates in insensibility and stertorous breathing, flushed or livid countenance, frequent heat of body, contracted pupils, afterwards becoming dilated, congested conjunctivæ, great heat of scalp, strong, quick pulse, involuntary motions, and occasionally convulsions and hæmorrhage from the ears or nose.

But although this is the most common cause, in other instances the premonitory symptoms do *not* give place to the second series, and then a condition of cerebral syncope becomes established resembling serous apo-

* Longmore, 'Ind. An. Med. Science,' No. xii, Cases 2, 6, 7, 8.
† 'Sir H. Rose's Despatch after Capture of Calpee,' 1858.
‡ Longmore, 'Lancet,' March, 1859.

plexy. The surface is cold, often bathed in perspiration, respiration gasping or scarcely perceptible, action of heart weak, pupils contracted, and insensibility complete. In this form there is no stertor; but as the disease advances, sonorous mucous râles.

2. Heat-apoplexy.—The symptoms of this do not differ from those just detailed, either in the earlier or latter stages; but inasmuch as heat-apoplexy occurs during the hours of night as well as in the day, it cannot be correctly described as coup de soleil or sunstroke.

3. Heat-asphyxia, due to exposure to the sun or to elevated temperature, may or may not be preceded by the premonitory symptoms before noted, and is characterised by insensibility more or less complete; heat of skin, which is generally deepened in colour; conjunctivæ sometimes pale, at others suffused; pupils contracted; breathing noisy, laboured, irregular, incomplete, and gasping, and, if effusion takes place, becoming stertorous; pulse quick, small, and thready; sometimes loss of power of the sphincter ani, at others difficulty of deglutition.

4. Cerebral Fever.—If neither of these conditions become established, the ardent or cerebral fever described in the preceding chapter may be the result of direct or indirect heat; but the symptoms there detailed will vary, and more resemble those of heat-asphyxia, according as the brain or lungs are most implicated.

Post-mortem appearances.—Heat of body inordinately high; serous effusions and congestions in the cranial contents; congestion of the lungs, and accumulation and coagulation of blood in the right heart; patches of redness in mucous membrane of stomach and intestines.

Pathologists are not agreed respecting the intimate nature of this disease, about the manner in which it destroys life; but it would appear that a fatal result happens in three modes at least. In those cases of fearfully sudden death, either occurring from coup de

soleil, heat-apoplexy, or heat-asphyxia, it cannot be doubted that the sun's rays, or the intense heat, act on the brain like a shock, a condition resembling concussion being first established, in some cases terminating in immediate arrest of the heart's action and death, and in others where the medulla oblongata is more, and the brain, perhaps, less affected, giving rise to stertorous breathing and other comatose symptoms.

When the brain and medulla both become affected in nearly equal degree, or when the latter is most affected, accumulation of blood takes place in the right heart and in the lungs, with secondarily, as a necessary consequence, a want of that fluid duly arterialized in the brain. In short, there is death commencing at the lungs, on the asphyxiated condition taking place suddenly instead of gradually, as in the other varieties where death occurs from coma or slow asphyxia.

These may be considered cases in which the nervous system is primarily involved; but it is also certain that intense heat will affect the circulatory system before or in a greater degree than the nervous, and in such cases a minor degree of cerebral fever is the result. This condition appears to depend on the balance of the circulation being disturbed, just as occurred from the opposite extreme in the severe weather of 1860-1, in London and in Paris, when the number of seizures of apoplexy was so great that it was described as epidemic.*

If the causes of this disease are recollected, it will be at once understood how they predispose to attacks. High temperature, with its direct sedative effects, and the quick evaporation from and inspissation of the blood, the rarefaction of the air, and consequent diminished supply of oxygen at each inspiration, and resulting deterioration and venalization of the blood,

* The *Times* leading art., Jan. 25, 1861; 'Lancet,' Jan. 19, 1861.

together with debility, fatigue, depression, exeitement, and malaria, are certainly likely to predispose to and exeite nervous and circulatory disturbance.

Dr. Chevers * considers there are many reasons for supposing that this disease is the cholera pestilence attacking the patient with that concentration of poisonous influence which at once induces asphyxia, by destroying vitality of blood. I cannot, however, agree with this theory, as heat alone is sufficient to cause the former, but not the latter.

Treatment.—Having endeavoured to show that the primary evil in all forms of this disease, excepting the last, is as Mr. Brougham † remarks, "exhaustion from heat," it must now be as prominently insisted upon that this fact should never be absent from the mind of the surgeon. But, on the other hand, this knowledge must not cause him to flinch from the use of depletory measures, if the condition of the patient demands them. The treatment of cerebral or ardent fever has been already indicated; and when coup de soleil and heat-apoplexy are eharaeterised by complete insensibility, flushed countenance, full pulse, and other clear symptoms of determination to the head, the same general or local bloodletting, cold affusions, mercurial and other purgatives, or injeetions will probably be required.

In like manner, when any form of the disease is preceded by cerebral symptoms of the sthenic order, the extraction of blood should never be neglected.

In this disease, as in most others, the propriety or otherwise of bleeding has been the subject of much discussion. Longmore ‡ and Pirrie § found bleeding of no use. Butler ‖ feels assured some of his cases would have died without it; *and so adverse opinions might be quoted in great numbers.* The fact is, it is quite im-

* Chevers, 'Ind. An. Med. Sci.,' No. 12.
† Brougham, ibid., "Remarks on Heat Apoplexy."
‡ Longmore, 'Lancet,' March, 1859.
§ Pirrie, 'Lancet,' May, 1859.
‖ Butler, 'Ind. An. Med. Sci.,' vol. xii.

possible to lay down stringent rules for the treatment of this disease. The constitutions of patients are diverse; men are afflicted with this affection under various circumstances of fatigue, excitement, malarious influence, &c.; epidemics differ in degree and characteristics; and these facts may, perhaps, account for remedies found effectual in one place being the reverse in another. In this disease, as in most others, the treatment must be deduced from a rational and judicious consideration of the symptoms and concomitant conditions and circumstances presenting. Surely the quick and effectual relief of congestion by bleeding is demanded in some of these cases of sun-stroke? This measure does not prevent the use of stimulants and cold affusion, neither is the combination unscientific. Loss of blood is an eventual evil, certainly; but, in treating this disease, it is often necessary to choose the least of two evils.

In that variety stimulating serous apoplexy, stimulants and warmth to the extremities are required, but the former must be administered with caution, on account of the tendency existing to merge into the first form of the disease.

In the heat-asphyxia depending, as it appears to do, on a sedative influence exerted on the spinal cord and brain, and occasioning a want of arterialized blood in the latter, the efficacy of bloodletting is more questionable. In such cases it must be practised with the greatest caution. Shade, position, cold affusion, cool atmosphere, friction of extremities, quick purgation, diffusible stimulants, Ammonia or mustard to the chest or nape of the neck, engaging the patient's attention by loud talking, and perhaps Marshall Hall's "ready method," are the means of relief.

In all forms of sun-stroke the patient should be encouraged to drink plentifully of cold water, to supply the place of the evaporation constantly taking place.

All the forms of sun-stroke are to be regarded as most dangerous. They are frequently followed by

fever, neuralgia, and paralysis of certain muscles; and they sometimes leave permanent cerebral injury, which in more than one instance I have seen terminate in insanity. Moreover, should recovery seem complete, it often happens that the individual is unable afterwards to bear exposure to the sun, and, in consequence, becomes unfitted for the active duties of a soldier or sailor in the tropics, and probably eventually suffers from ramollissement.

When once a soldier or sailor has been the subject of a severe form of this fatal affection, there is, as Mr. Longhurst* states, absolute necessity for his removal to a colder climate. This gentleman records cases of men allowed to remain in the country, "not only to suffer again, but to sacrifice their lives;" and I have seen cases of a similar kind. There is no reason, however, why a soldier should not discharge his duties in a colder climate, ensuring thereby his own life and a very considerable saving to the state.

Means of Preservation.—Avoidance of exposure to direct solar heat; the artificial cooling of dwellings by punkahs and tatties; wearing proper head-dresses, or such as fit closely to the scalp, by which the perspiration is confined, and the head kept constantly moist. The ventilating hats, so vaunted by their contrivers, do not fulfil their purport; the apertures round the circumference allow the hot winds to pass freely over the cranial surface, keep it constantly dry, and thus predispose to attacks of the malady they were designed to prevent. Wetting the head-dress in water, when obliged to go abroad in the sun; using a shade for the upper part of the spine; a white covering, which even in the shade reduces the temperature two degrees, and in the sun from 130° to 111°;† attention to ventilation and cubic space in barracks, hospitals, and dwellings. It has also been advised that troops marching in hot weather should

* Longhurst, "On Coup de Soleil," 'Lancet,' Jan. 7, 1860.
† Colonel Sykes, 'Journal Statis. Soc.,' vol. xiv.

do so in very open order, by which ventilation in the ranks is secured; a source of much comfort, as all will allow who have ever made a hot and dusty Indian march.*

CHAPTER III.

LICHEN TROPICUS, OR PRICKLY HEAT.

This affection, like the previous dangerous disease, is due to continued and extraordinary heat. It is, however, rather a manifestation of a healthy and vigorous habit than the reverse, and is most frequently observed in robust Europeans or in those latterly arrived from a colder climate. It has also been known to follow disordered stomach, and in children to come on during teething, which may therefore be considered as additional causes. It may also be a manifestation of a too liberal or carbonaceous diet.

Symptoms.—Eruption of small hard pimples, more or less red, usually spread over the abdomen, breast, arms, back, neck, or forehead. Exercise and perspiration deepen the colour of the eruption, which is accompanied by severe itching, prickling, and tingling. It frequently terminates in desquamation, or sometimes a few of the pustules contain a minute quantity of pus. Fresh crops arise in rapid succession.

Treatment.—It is not prudent to attempt to check the eruption, which will probably subside as the constitution of the individual becomes accustomed to the climate, although, indeed, it is sometimes observed on very old residents who enjoy robust health. Light clothing, temperate diet, and an occasional aperient, the application of an alkaline wash, or sprinkling the parts with violet powder, will afford relief.

* Murray, 'Madras Med. Journal,' vol. ii.

CHAPTER IV.

DISEASES OF THE LIVER.

Inasmuch as these diseases are more or less the results of increased temperature, their consideration is undertaken in this section. I have not thought it necessary in a work of this scope to treat, 1st, increased secretion of bile, 2nd, irregular secretion of bile, 3rd, deficient secretion of bile, as separate and distinct diseases. These are but links in a chain, often premonitory of congestion or inflammation, and (the first state, at least) frequently tending to the preservation of health. The following remarks, however, contain much of what could be stated if these conditions were treated of under distinct heads.

The system of the European, exposed to the high range of temperature of India, immediately begins to accommodate itself to the altered circumstances. The rarified air, probably containing less oxygen than an equal volume of the atmosphere of colder climates, prohibits the elimination by the lungs of the same amount of carbon which was previously expired, while perhaps more of the latter, in the shape of food and drink, is daily introduced into the system. At the same time, less physical exercise being taken, there is diminished combustion and consumption of tissue, and the sympathy between the cutaneous surface and internal organs is rapidly modified. All these causes tend to congest the liver and, indeed, the whole portal system. As a relief to this congested state, an increased, often copious and acrid, secretion of bile takes place, which manifests its presence by an irritating and troublesome diarrhœa. This (almost the only process of climatization, if it can be so called, which takes place in India) will in most cases subside

after the bilious material has passed away. Sometimes the aid of an aperient salt is required; and less frequently it is desirable to allay the intestinal commotion which the acrid bile excites, by small doses of Opium or the Comp. Ipeeaeuanha powder. In all cases moderation of diet must be insisted upon, and in severe attacks the recumbent posture should be adopted, and spoon diet only allowed.

As in other organs temporary excitement is followed by depression, so this excessive aetion of the liver is followed by more or less torpor, leading to deficient secretion of bile, eostiveness, and pale stools, and giving rise to headache, furred tongue, foul taste in the mouth, and an irritable, exeiteable, and sometimes depressed condition. Saline purgatives, exereise, and moderation are here demanded.

These two actions alternating with eaeh other give rise to irregular secretion of bile, which continues more or less until the organs are accommodated to the ehange of functions which the climate induces. This excited condition of the liver may not, however, relieve itself by a spontaneous diarrhœa. Instead of passing off by the bowels, the bilious material in some cases produces feelings of nausea, sickness, and headache, causing the individual to suffer from what is popularly known as a bilious attack; or indeed this may be present with more or less diarrhœa, as before described.

In other eases diarrhœa and hepatie derangement is less manifest; but nature relieves the overcharged system by a succession of painful boils or suceessive eruptions of liehen tropicus.

Should neither of these modes of relief occur, the liver becomes tender, bulky, and full; the condition of congestion of the liver being perhaps slowly, but surely, established.

CHAPTER V.

CONGESTION OF THE LIVER.

Causes.—Hot climates; sudden changes of temperature, and exposure to chills and damp; repeated cold stages of intermittent and remittent fever; overfull and stimulating diet; abuse of stimulating liquors; solar exposure; crowded barraeks or other dwellings.

Symptoms.—Sallowness; coated tongue; depression of spirits; defective appetite; headache; bowels acting irregularly; stools dark and depraved; pulse in some eases unaltered, in others slow, oppressed, irregular, quick, or feeble; nausea and vomiting; respiration of right side more or less oppressed; a sense of weight and fulness; recumbent posture, sometimes uneasy on the right side, at others on the left; enlargement of the liver, principally upwards in the right thoraeic eavity.

Post-mortem appearances.—It is not often that death results from eongestion alone, inflammation and abscess generally preceding a fatal result. A eongested liver is large and dark from impeded circulation, and full of blood and bile. The texture is softened, and the colour varied, according as the congestion rises from hepatie to portal and general.

Treatment.—In robust constitutions, and in those reeently arrived in India, bleeding will probably be required, followed by leeehes. In old residents and the anæmie, leeehes alone, or, if they cannot be borne, dry cupping. One or two doses of Calomel; saline purgatives; fomentations, and abstinence in diet. If the full habit and strength of the patient warrant, bleeding must not be neglected in consequence of oppressed and feeble pulse, as the latter will rise under such treatment.

CHAPTER VI.

HEPATITIS.

Causes are essentially the same as those producing merely congestion. According to Dr. Budd, absorption of morbid matter from the ulcers of dysentery is a frequent cause.

Symptoms. — Pain in right hypochondrium, increased by pressure, by deep inspiration, by coughing, by lying on the left side; difficulty of breathing; shooting pains, resembling pleurisy; pain in the right shoulder, sometimes under the right clavicle or in the left shoulder; a yellowness of the conjunctivæ; occasionally jaundice; high-coloured urine; nausea or vomiting; costiveness or diarrhœa; deficiency or redundancy of bile in the evacuations. The disease is frequently ushered in with rigors and a sense of constriction of the skin, followed by febrile reaction; but, in many cases, the circulation is but little quickened.

When the concave surface of the liver is affected, pain is more obscure, and is referred to the back; but the functions of the stomach are more disturbed, there being vomiting, hiccough, epigastric pain,—indications of the ducts, duodenum, and pylorus being implicated.

Pain of an acute character leads to the conclusion that the peritoneal covering is more involved; disturbance of the functions of the kidneys, irritable bladder, and lumbar pain, that the posterior inferior part is most affected.

A diminished quantity of urea in the urine has been noted in cases of hepatitis, but is not a symptom worthy of much trust. Tension of the right abdominal muscles are often co-existent.

There are several affections which may, possibly, be confounded with disease of the liver. It is known from pneumonia, by the pain in the shoulder, by the

absence of expectoration, and stethoscopic signs of diseased lung, and by the enlarged and tender state of the liver. Only a careful consideration of the peculiar symptoms presented by an individual patient will, in some obscure cases, establish a correct diagnosis from gastritis or dyspepsia.

Although the liver may be felt with ease, particularly if the patient turns towards the left side, still percussion is preferable for the examination of this organ; for, as Dr. Morehead observes, its limits can be thus ascertained with precision, even when too tender to admit of manipulation.

Post-mortem appearances.—Discoloration of the peritoneal covering. Thickening and adhesions to colon, stomach, and diaphragm. Liver dark, vascular, and occasionally indurated. Depositions of coagulable lymph. Gall-bladder enlarged, and filled with viscid bile; or diminished in size, with thickened coats. Redness of serous coat of portal vein.

Adverting to the fact that secretion is frequently little interrupted, it would appear that the inflammatory action is mostly confined to the arterial capillary circulation leading to the usual results of effusion of lymph and formation of pus; the former of which may terminate, if life be spared, in chronic enlargement and eventually cirrhosis.

Treatment.—Some authors have asserted, that bloodletting ought not to be carried to the same extent in hepatitis as in other inflammations, assigning as a reason the peculiarity of the portal circulation; but, in this disease, suppuration of the most deadly character is dreaded, and the treatment should be proportionably energetic, always having reference, however, to the strength, habit, length of Indian residence, and previous constitution of the patient. It is necessary to run some risk of inducing the Scylla of cachexia and debility, rather than allow the Charybdis of abscess to form unchecked; and hence general or local bloodletting is usually demanded. But it is only at the commencement of inflammatory action that bleeding

is beneficial; when exudation may be supposed to have taken place, depletion must not be undertaken, as the degeneration of lymph into pus would thereby be aided.

The question arises, What symptoms are to direct the propriety, or the reverse, of bleeding? and this is an interrogatory extremely difficult to answer, except at the bedside. A cheerful general aspect, a full, firm pulse, an equable, moist, though increased temperature, without cold sweats, rigors, irritative fever, and other signs indicative of suppuration, are the chief guides for depletion, which should then be performed, as Martin observes, "the sooner the better for the patient." If the health be broken down by intemperance, bleeding is inadmissible; and any time, from the commencement of the disease, during which it may be performed, cannot be even approximately noticed, as suppuration may take place in a few hours, or be delayed days. The sense of local and general relief which follows the abstraction of blood will manifest to the practitioner that he has pursued the proper course.

The use of the next long-supposed great remedy for inflammatory states, viz., Mercury, although sanctioned by high authority, is, at the least, of questionable efficacy in hepatitis. Dr. Hanfield Jones, 'On the Action of Cholagogue Medicine,' states a very important effect of the administration of Mercury was noticed to be congestion of the liver; and although, by producing a greater flow of bile into the intestines, this mineral tends to relieve a tumid liver, still there is reason for believing that it induces the formation of a quantity of bile equal, at least, to what it expels. Thus, it directly excites an organ already in a too irritable condition and certainly prevents rest of both circulations, so essential in inflammation of all other parts. If also it be true, as stated by Dr. Thudichum* and Virchow,† that Mercury does

* Dr. Thudichum, "On Diseases of the Liver," 'Trans. Med. Soc. Lond.;' 'Lancet,' Oct. 20, 1860.

† Virchow's 'Archiv,' vol. xii, p. 69.

not pass off in the bile, and that it may be detected in considerable quantities in the liver, then additional exeitement and eongestion must result from its accumulation there.

It is difficult to understand, as some authors desire to show, how Calomel, by its double action of "drawing off" and "increasing secretion," can relieve the loaded liver, the matter which it expels being immediately replaeed by freshly formed bile caused by its own stimulation; neither can it effect much good by "unloading the portal system," this supposed result of its exhibition being inconsistent with the fact that it increases the secretion of bile and flow of blood in that system.

Mercury certainly has some influence in retarding the deposition of the lymph-products of inflammation, particularly when serous membranes are affected; but that it necessarily or generally does so is not the fact, as all would admit (even before the publications of Dr. Todd and Dr. Habershon) who have seen acute disease terminate fatally, although the system was fully and early mercurialized, and who have seen the inflammatory degenerations, lymph or pus, filling the organs affected.

In a work of this scope, a discussion on the action of Mercury eannot be attempted; but it would appear that Mercury in hepatitis, as in all other inflammations, is beneficial, not by its increase of secretion, but by its febrifuge effect consequent on the removal of viscid intestinal accumulations, by its unloading the vascular system generally, by its acknowledged solvent and alterative action on the blood, and by its occasional peeuliar specific power as an antagonist to inflammation. On the other hand, it is injurious by the congestion and increased action it creates in the liver, and it is more than probable that its injurious effect predominates over the beneficial.

I believe that one or two doses of Mercury at the commencement of liver disease, or occasionally during its progress, will induce all the good that can be

effected by this remedy, and that this benefit results from the removal of acrid bile contained in the ducts and gall-bladder, thus rendering the passage clear for the flow of newly secreted fluid, which even during acute inflammation is often copiously formed. I do not think the constitutional effects of Mercury are requisite or proper for the cure of hepatitis; neither do I consider such doses as ten, fifteen, or twenty grains of Calomel should ever be exhibited. The happiest results have followed the employment of depletion, regulated according to the rules formerly advanced, saline purgatives, Opium at night, diaphoreties, fomentations, leeches, and occasional mercurial purgatives given as above intimated.

CHAPTER VII.

CHRONIC HEPATITIS.

CAUSES.—The acute form; high temperature; atmospheric changes; chills; intermittent and remittent fever; crowded barracks.

SYMPTOMS.—Unless the attack follows the acute form, it comes on so gradually that it is often long unattended to. The first symptoms are a sensation of weight in the right hypochondrium, occasional pains of a shooting character, followed after a longer or shorter period by loss of appetite, flatulence, and dyspepsia. The liver then becomes full and hard, sometimes may be felt below the ribs, and, at others, projects upwards in the thoracic cavity, causing bulging of the side and impaired respiration. There is also sympathetic pain in one or both shoulders, and probably dry, hacking cough. The countenance becomes sallow, the skin dry, the patient desponding, and a general cachectic condition ensues. Bowels are

costive, or the reverse. Stools dark or clay-coloured. Pulse occasionally intermittent.

It may be diagnosed from empyema and pneumothorax by the non-protrusion of the intercostal spaces, and, in many instances, by feeling the tumour under the margins of the ribs, and by the absence of the stethoscopic sounds of these two conditions.

POST-MORTEM APPEARANCES.—Thickening of the peritoneal surface; alterations of colour; redness; vascularity; mottling; depositions of lymph or pus in numerous roundish masses; adhesions to adjacent parts. The disease essentially consists in the formation and deposit of lymph in the areolar structure surrounding the portal vessels. It is this engorgement and subsequent effusion of lymph which is frequently treated of as congestion followed by chronic inflammation; and, like the same condition, becoming more slowly, and perhaps, locally established from the effects of alcohol. Chronic enlargement from heat may, if abscess does not form and prove fatal, eventually pass into cirrhosis. From this it is easily understood how intemperance will add to the effects of hot climates, in the induction of liver disease.

TREATMENT. — Saline aperients every morning; Iodide of Potash, with Taraxacum; chalybeates. If stronger purgatives are required, the vegetable ones demand preference. The vapour-bath and friction; the nitro-muriatic bath; the chlorine bath; Nitro-Muriatic Acid internally. But, should the disease persist, as it probably will in India, change of climate must be unhesitatingly recommended; a suitable time being chosen, if possible, in order that the individual may not be introduced too suddenly into a lower temperature. Great attention must be paid to suitable clothing, the skin kept well cleansed, and the diet be generous, including eggs, meat, fruit, and vegetables, which are generally better digested than starch or fatty material. The fatal error of treating with mercurials the various chronic disorders of the liver cannot be sufficiently deprecated.

CHAPTER VIII.

ABSCESS OF THE LIVER.

Suppuration of the liver originates, 1st, suddenly, during the progress of acute hepatitis; 2nd, gradually, after chronic inflammation; 3rd, insidiously, without previous inflammation; 4th, during the progress of dysentery.

1. If, during a case of hepatitis, severe rigors occur, there is reason to fear suppuration has taken place, especially if followed by cold sweats, obstinately furred tongue, scanty and high-coloured urine containing lithates, hectic or irritative fever, and emaciation or colliquative diarrhœa.

2. The most frequent manner, however, in which abscess of the liver manifests itself is after the prominent symptoms of acute hepatitis have been relieved. The patient does not recover health, remains weak and languid, and, after a variable period, complains of occasional chills, and febrile excitement towards evening. This soon assumes a hectic character, and is accompanied by a tongue furred in the centre, but red at tip and edges. Often weight and uneasiness are experienced in the right hypochondrium. Generally dry cough, and less frequently acute shooting pains; the palms of the hands are preternaturally dry and hot, and the appetite variable.

3. But there is a deep seated and, as it has been designated, "suppurative" inflammation of the liver, which runs its insidious progress without any urgent symptoms, without previous fever, inflammation, or congestion, in fact, without any signs at all. At other times there is a vague sense of uneasiness, or obtuse dull pain, or a slight sense of weight and oppression, more

or less apparent according as the disease is centred in the interior or located towards the exterior of the organ. These anomalous feelings, perhaps with slight cough, are signs scarcely appreciable by the too frequently doomed patient, or, if observed, considered too trivial to induce application for medical advice; and often it is not till tumour occurs, with rigors and cold sweats, that the serious nature of the disease is understood. Budd and Martin will give instances of this nature. It also is indisputable that abscess may slowly form, become encysted, perhaps partially absorbed, and so remain for months or years, giving perhaps not the most obscure indication of their presence. Dickson states, "I have known patients die of abscess of the liver, who never in life had experienced any of the symptoms." Such a case had also fallen under my own notice, thus justifying the remark of Dr. Copland, "a person, after being resident in India, cannot be sure if an abscess exists in his liver, or not."

4. That a very large number of the fatal cases of dysentery are complicated with hepatic abscess is a well-established fact; but that the hepatic abscess is caused by absorption of vitiated matter from the diseased intestine is questionable. In practice it is found that a great number of these cases are individuals predisposed to hepatitis by former disease; but, however this may be, if during the progress of dysentery the emaciation and languor are greater than can be accounted for by the existing dysenteric symptoms, if evening hectic and the condition of tongue before noted appear, then there is little cause for doubting that hepatic abscess has become established.

According to the size and situation of the abscess, physical symptoms may be more or less clearly presented. Fulness and hardness about the epigastrium indicate disease in the left lobe, while cough, impaired movement of right ribs, fulness, and dulness are characteristic of an affected right lobe. Abscess extending in the latter direction frequently excites pleuritic or pneumonic inflammation, and may be con-

founded with theresults of such diseases as hydrothorax, empyema, or consolidated lung. The history of the case, however, is generally sufficient for diagnosis; and, as observed by Dr. Watson, that in Europe pain so occurring about the lower part of the right ribs is oftener due to inflammation of the pleura than liver; so, in India, signs of compression and displacement of the lung, occurring in the same position, are mostly indicative of the liver being affected.

Terminations of Hepatic Abscess. — Abscess of the liver may burst into the stomach, and be emptied by vomiting; into the colon or duodenum, and be evacuated by the bowels; through the diaphragm into the cavity of the chest, and form empyema; into a bronchial tube, and be expectorated; into the pericardium or peritoneum; and lastly, externally through the muscles of the abdomen.

Treatment.—All operative interference is now universally condemned. The proper treatment is to support the strength of the patient by tonics and nutritious diet; and should the abscess point externally, to favour its discharge by poulticing, fomenting, and position. The integument should be allowed to become reddened, and show positive evidences of pointing, before matter may be artificially evacuated. Some even advise to allow the skin to ulcerate naturally; for, as Dr. Budd has pointed out, the solid tissue of the liver cannot readily collapse, so as to close the cavity, after matter has been evacuated through a free incision. The plan of exploring the liver by thrusting in a needle is only mentioned to be condemned, which Dr. Stovell has done in these terms, "I cannot conceive the existence of any case which could require or justify the adoption of such a measure."

In hepatic abscess the prognosis must certainly in all cases be most unfavorable; but as in collections of matter occurring in other parts, so in this dangerous disease, external pointing is the course most likely to result in cure.

CHAPTER IX.

JAUNDICE.

JAUNDICE is frequently seen in India, without any recognisable disease of the liver, or in consequence of the passage of a gall-stone ; but, in by far the majority of instances, it is a symptom of some existing hepatic derangement, either occurring during the progress of one or other variety of fever, or arising without that disease. Here it is not necessary to discuss the different methods by which jaundice may be induced. It is sufficient to regard it as a symptom of some internal functional or organic disturbance, which may sometimes be readily recognised, but at others remains very obscure. Jaundice resulting from congestion, from obstructions, as from calculi—from destruction of hepatic cells, as in chronic liver diseases—or from stagnation of viscid bile (perhaps the icterus spasmodicus of Cullen), are the forms generally met with in India.

In treating the calculous form of the disease, which is equally recognised by the attendant pain, Opium and the warm bath are the chief remedies. In cases where no tenderness about the liver exists, saline cathartics, alkalies, Taraxacum, and the Nitro-muriatic Acid, internally and as a bath, are desirable. If the icterus arise during the progress of other diseases, the latter must be treated by their appropriate remedies. Mercurials are not indicated as remedies for jaundice, excepting when the probability of inspissated bile in the gall bladder and ducts exists. Then an occasional dose of Calomel, to remove this secretion, may be given with advantage.

CHAPTER X.

HYPTALGIA.

This affection does not appear to have been recognised by the authors of our large works on Indian diseases, nothing on the subject being advanced by Morehead, Martin, Annesley, and many other Indian writers. Dickson, however, in his work on the prevailing diseases of India, says, "I have had to treat some troublesome cases which might be appropriately termed rheumatism of the liver."

Causes are very obscure. Possibly the pain is due to some change or thickening of the areolar tissue surrounding the nervous ramifications, which, however, cannot be ascertained by examination.

Symptoms.—Slight uneasiness or sense of weight in the right hypochondrium, so slight indeed as to be frequently forgotten when the mind is occupied, occasionally absent for a day or two, and returning without assignable cause. There is also uneasiness in the shoulder, which feels tired as though from long action. Sometimes sharp twitches, resembling pleuritic pain, are felt in the hypochondrium, which is occasionally stated to be tender; but examination does not confirm this, or, in fact, detect anything unnatural. The mind often dwells on this uneasiness, and the individual is in constant dread of some serious disease supervening, together with languor, want of resolution, and a disposition to seriousness. Appetite and digestion generally good.

This disease may last for years, and perhaps may be the evidence of a small abscess existing in the liver. Accordingly these symptoms must be at first regarded with grave suspicion. If, however, months elapse during which the individual enjoys good health, and

perhaps gains flesh, we are justified in then classing his disease amongst neuralgic affections. Morehead* refers to acute pain in the hepatic region occurring in anæmic females, without attendant febrile symptoms, but with hysteric phenomena. This may be regarded as neuralgic.

Treatment.—Blisters will relieve the pain for a time, but do not do so permanently. Belladonna and Guaiacum plasters are useful. Tonics are beneficial, the best of which is Arsenic; for, as Dr. Billing pointed out, in addition to its tonic and anti-periodic properties, this mineral has also an emulgent action on the liver. Medicines, however, are of but little avail: occupation of the mind is the best remedy, either by travel or some engrossing pursuit. When the affection occurs to Europeans who have proceeded home, as it frequently does, return to the warm climate of the tropics will generally effect a cure; while in India a change from one station to another is often beneficial.

Section III.—Diseases depending on the combined effects of Heat and Malaria as a chief cause.

CHAPTER I.

CACHEXIA LOCI.

The anæmic tendency of all Indian diseases has been prominently brought forward in the Introductory Remarks to this work. The asthenic results of intermittent and remittent, the effects of enlarged

* 'Clinical Researches,' vol. ii, p. 122.

spleen in retarding assimilation and nutrition, of cholera with its albuminous waste, of dysentery with its exhausting discharges, of liver disease, with its attendant stagnation and loss of vitality of blood, the debility consequent on the employment of too energetic and antiphlogistic treatment, and the cachexia which is but too prone to result when such treatment becomes "a remedy of necessity," have been, or will be, all sketched, with their attendant preventive or curative means. These, however, are not the only causes of anæmia. The climate, with its malarious influences and its scorbutic tendencies, prolonged and excessive heat, moisture, and chilling cold, the loss of appetite, the sleepless nights, the immoderate perspiration, the sudden chills during the latter, the occasional extraordinary fatigue and exposure which military men particularly are called upon to undergo, will induce *debilitas* as a disease *per se*, and without any prior or concomitant febrile, congestive, or inflammatory disorder. The delicate female, the naturally physically weak European male, and natives of both sexes, are alike subject to this cachexia loci, of which a sallow, bloated, ex-sanguine countenance, pearly conjunctivæ, impaired digestion, palpitations, tinnitus aurium, attenuation, disinclination to exertion, impaired memory, frequent spermatorrhœa, albuminous urine, or oxalate-of-lime crystals in that fluid, a white, pale, tremulous tongue, aching of the limbs, particularly the lower extremities, a feeling of thorough weariness, hepatic or eczematous eruptions, great irritability, indifference as to the future, depression, and occasionally attempts at self-destruction, are the chief symptoms. There is also frequently rheumatic or neuralgic pain in the abdomen, which may be tumid; perhaps eruptions of painful boils, and disposition to hæmorrhagic discharges.

That natives of India, when taken to different parts of the peninsula, are subject to this disease, numerous authorities might be quoted; and with these people it is always combined or preceded by nostalgia.

In the European, the latter is scarcely ever so forcibly expressed.

If an individual in this anæmic condition remains long exposed to the influences of the climate which have induced his cachexia loci, a gradual enlargement of liver and spleen will probably arise, intermittent fever recur, and, probably, insidious hepatic suppuration take place.

Treatment.—Medicines are of little avail. Tonics, as Quinine and Iron, with generous diet and a liberal allowance of malt liquor, are indicated. Fresh vegetables are also required. The only means of cure, however, is a thorough change of climate; and even after this is effected it will probably be months, and may be years, before the patient recovers his former vigour. It is in these cases that mountain pure air proves so beneficial, and enables the convalescing tourist of the Scottish or Welsh hills to acquire a Spartan state of health, and "throw physic to the dogs."

CHAPTER II.

DYSPEPSIA.

The same causes which induce the condition previously considered will in other instances establish dyspepsia in one or other of its protean forms, or the latter may be an early symptom of the approach of cachexia loci. In India we meet with two forms of dyspepsia; the one following, in any constitution, excesses in eating or drinking, and the other depending on the same causes as the asthenic and cachectic condition so generally met with. Both varieties are characterised by such symptoms as anorexia, nausea, vomiting, epigastric distension, and watery, gaseous, or

acid eructations; but, in the one instance, there is merely deranged digestion depending on temporary causes, while in the other there is mal-assimilation, mal-secretion, and a debilitated condition of the nervous and muscular functions. In the one case, abstinence and simple alterative medicines only are required; but in the latter, change of climate will alone prevent the establishment of that cachexia loci, which is the almost certain sequel. Of course, individuals (and of such there are many) who have naturally feeble digestive powers will become "martyrs to indigestion" in a tropical climate; their weakness in this respect, and the debilitating influences of the climate, tending mutually to aggravate each other.

CHAPTER III.

CEREBRAL DISEASE—RAMOLLISSEMENT.

Among the natives of India, and among Europeans in India, all varieties of cerebral disease, as softening, tumours, hypertrophy, and induration of the cerebral mass, tubercles and effusion of lymph, are occasionally met with. These, however, arise for the most part independently of any climatic influences, and therefore cannot be considered as Indian diseases. Ramollissement, however, so frequently affects the brain of the European who has remained long in the country, that this particular change must be admitted into the list of diseases to which Europeans in this country are peculiarly liable. Old residents in India, men generally of good constitution, who have escaped the serious results of previous disease, and particularly those who have had great solar exposure, or who have previously suffered from one or other of the forms of insolation, are, in advanced life, more liable to ramollissement of the brain than others of the same

class resident in colder climates; and this is generally combined with a certain amount of atrophy of the general muscular system.

Hence this disease may arise from two causes; first, by previous inflammation of the softened part; and secondly, by what may be called its starvation, due to the general debilitating influences of a tropical climate affecting this essential portion of the human frame. The first cause having been applied from insolation or exposure, the action of the latter becomes more certain in its results.

Symptoms.—The symptoms of this affection, as noticed in India, are fixed pain in some portion of the cranium, sometimes having acute paroxysms, at others intermitting altogether; loss of memory and intellectual powers; emaciation; perhaps intermittent pulse; and, in the latter stages, paraplegia. If the former of these symptoms occur after sun-stroke, insanity may be expected; if they arise in an old resident, the latter state, paraplegia, may with certainty be prophesied.

Treatment.—The only method of treatment consists in relief of pain by local applications, and in renovation of the general health by removal from the noxious influences of climate. By such procedure a few years may be added to life; but eventually the ramollissement will become abscess, and the patient die suddenly or paralytic.

CHAPTER IV.

DISEASES OF THE WOMB.

The influence of tropical climates on the rise and progress of uterine disease does not appear to have received that attention which the subject demands from Indian medical authors. This has, very pro-

bably, arisen from the duties of so many surgeons in India being purely military, and consequently having meagre opportunities for the investigation of this class of complaints. The subject has, however, been latterly brought forward by Dr. Tilt,* and, undoubtedly, his researches will be followed by those who, resident in India, may be better enabled to prosecute such inquiries.

It is an undoubted fact that the female natives of tropical climates suffer to a great extent from one or other of the different forms of uterine disease. The answers to the inquiries of Dr. Tilt, from Dr. Hewart, formerly physician to the Hospital for Native Women at Calcutta; from Dr. Kirkman, of Trinidad; from Dr. Dundas, of Bahia; and others, demonstrate this. Dr. Stewart does not hesitate to say that "eight out of ten of the European female residents are habitually subject to deranged menstruation, leucorrhœa, or cervical excoriations."

Causes. — Many causes combine in inducing a greater tendency to uterine disease in the European female resident in India, some certainly preventible, but others not so much so, inasmuch as the latter consist of climatorial influences. The preventible causes are young females being subjected to a fatiguing voyage, with its attendant emotion on leaving England and home; excitement consequent on a succession of new scenes; and sea-sickness, before the menstrual function has become properly established. That mental emotion and the action of vomiting are each sufficient of itself to delay the approach, or induce before its period, an established or unestablished catamenial flow, does not require demonstration here. In addition, there is frequently exposure to chilling winds and moisture, neglect of suitable clothing, the tedium and fatigue of a long march up country, and, lastly, the early marriages so constantly negotiated, all powerful

* 'Lancet,' March, 1860.

agents to disturb the uterine, nervous, and vascular system.

It has already been pointed out that the first effect of tropical heat is a determination of blood to the liver and other abdominal organs, among which the womb must also be presumed to partake in the general congestion induced. Hence an hyperæmic condition is there established, which the constant periodic attacks of intestinal irritation from acrid bile, and its consequent diarrhœa, cannot fail in rendering more or less permanent. Intense congestion, excoriation, or ulceration, thus becomes excited, which again reacts on the adjoining organs to such an extent that cases of apparent dysentery have only been cured when the treatment has been directed to their real cause, viz., extensive ulceration of the neck of the womb. As time progresses, the probability of attacks of intermittent fever, masked or otherwise, is great, and the determination which then takes place during the cold stage will produce its most injurious effects in the weakest or most unhealthy organs, thus, again, directly tending to augment the before too irritable sexual system. Moreover, the womb, being an organ subject to regular periodic recurrences, would, as Mr. Hughes* observes and Dr. T. Smith endorses, be more likely to become "impressed with periodicity"—the effects of malaria —the sympathetic system being largely involved in supplying its nerves, and also that on which malaria exerts most influence. Superadded to all this is exposure, neglect of suitable clothing, errors in diet, producing abdominal irritation; the imprudent use of the cold bath; perhaps too frequent equestrian exercise; or, from the lassitude and ennui engendered by the climate, the neglect of a sufficient amount of physical exertion. Lastly, anæmia lymphatica, or cachexia loci, becomes gradually developed, con-

* "On Periodicity as a Character of Disease," 'Lancet,' Aug. 1, 1860.

comitant or not with splenic leucocythæmia; these conditions of deteriorated blood forbidding hope of recovery, indeed, inducing uterine disease in those who may previously have exhibited but a latent tendency. There is also, from the first, the continued influence of high temperature, inducing a laxity of tissues, a feebleness of muscular power, and that tendency to sub-acute congestion and inflammation of internal organs so frequently noticed.

The early marriages of European females have already been mentioned as a preventible cause. In the native female there can be no doubt that the calling into action of the sexual system before its thorough development, although developed so early in life among the inhabitants of tropical climates, is a frequent cause of womb disease. The aptitude and greater indulgence in venery which has been presumed an excitant among the latter class does not, I believe, exist, at least, among Europeans, in this enervating and debilitating climate.

Space will not allow a separate consideration of the several disorders of menstruation and the different diseases of the womb. The affection, perhaps, most prevalent among European females in this country is one or other of the varieties of dysmenorrhœa and menorrhagia. The periodical flow recurs at irregular intervals, is attended with exquisite pain, often of a neuralgic, at other times of a sub-acute, inflammatory, character. It is generally also profuse in quantity, and lasting longer than the usual period. As time progresses, under one or other of the influences previously named, the attack becomes truly inflammatory, and clots of dark, grumous material, shreds of false membrane, and stringy masses, pass away, the former suffering being considerably increased. The probability of excoriation or ulceration is great, prolapse of the womb may occur, and with increasing debility and cachexia sub-acute pelvic inflammation and organic disease may be expected.

Treatment.—Much good may be effected by leech-

ing, blistering, application of Iodine, injections, and application of Nitrate of Silver, with treatment directed to the renovation of the general health; but in the majority of instances, notwithstanding the employment of Quinine and other periodics, change of climate alone will afford permanent relief.

Section IV.—Diseases depending on Vicissitudes of Temperature as a chief cause.

CHAPTER I.

TETANUS.

That tetanus is a disease more prevailing in tropical than in temperate climates is an undoubted fact, but that it is very prevalent in India is not a correct idea.* On the contrary, it is comparatively seldom met with except in the large Presidency hospitals or city dispensaries, and then chiefly among natives, fewer instances relatively occurring in European wards. During seven years, according to Mr. Peet, 195 cases were admitted into the large Jamsetjee Hospital at Bombay.

Tetanus, as it exists in the East, has been subjected to the same distinctions, viz., idiopathic and traumatic, eccentric or centric, which is supposed to mark the disease as it occurs in colder regions, and Dr. Peet† has observed that the former is most common in the months of October, November, and December, while the latter was chiefly seen in April, May, and June.

* Morehead, 'Clinical Researches,' vol. ii, p. 622.

† 'Trans. Bombay Med. and Phys. Soc.,' series ii, vol. i.

Causes.—Morehead says, "It is most probable that there are diatheses influential towards the production of *both* idiopathic and traumatic tetanus;" and, while agreeing in this supposition, I must confess my inability of recognising what the difference between the *two* diatheses can be. Traumatic tetanus is a time-honoured variety of the disease, and I believe every author on the subject has adopted the distinction. Without, therefore, presuming to deny that tetanic spasm may attend injury of nervous peripheries, I think I may venture to state that other influences have a greater share in the production of this disease. There is no evidence to prove that so-called traumatic tetanus is the result from the direct cause of wounds and injuries, and I am sceptical as to the instances related by authors of its origin from the blow of a schoolmaster's ferule,* from the bite on a finger of a tame sparrow,† from the mere grazing of the heel,‡ from the irritation of the unhealed navel,§ or from other injuries simply producing abrasion of the cuticle.‖ Neither do I allow that "it is one of the most mysterious among the numerous consequences of local injury.¶ In fact, I believe cold, moisture, atmospheric vicissitudes, and transitions from heat to the reverse—nowhere so forcibly felt as in India—to be the chief excitants of tetanus. No doubt the disease often follows wounds and injuries, but is it not *post hoc* instead of *propter?* And can it not be accounted for by the change of life, diet, circumstances, exposure, and nervous shock, which an individual severely hurt experiences, aided, perhaps, by diseased blood, caused by the absorption of a morbid animal poison, developed by perverted reaction of the wounded surface? In the records of campaigns, and in the writings of Hennen, Guthrie,

* Curling's 'Jacksonian Essay,' "On Tetanus," p. 63.
† Watson's 'Lectures,' vol. i, p. 573.
‡ 'Lancet,' December 8th, 1860.
§ Elliottson, 'Practice of Medicine,' Art. "Tetanus."
‖ Watson's 'Lectures.' Rees, 'Encyclopædia,' Art. "Tetanus."
¶ Skey, "On Tetanus," 'Lancet.'

Blane, and others, numbers of cases of tetanus occurring to wounded soldiers are on record; but the concomitant circumstances were, cold moisture, nocturnal air, and exposure, which the observations of Larry tend to show were found particularly conducive to the development of the disease. Again, Sir James McGrigor states,* in the Peninsular war, in every disease, and in every stage of wounds, from the slightest to the most formidable, from the healthy and sloughing to the incised and lacerated, from the most simple to the most compound, tetanus was a sequel; but he also remarks, in almost similar terms, to Sir G. Ballingall, that the affection chiefly occurred in low, damp situations "adjacent to the Nile, or near the sea."†

I have on several occasions seen trismus, or complete tetanus, follow extensive superficial burns and scalds,‡ such condition of surface being inordinately sensitive to external impressions from atmospheric changes. Jackson§ states, atmospheric vicissitudes tend much to promote proclivity to the disease, and also that it frequently occurs in India after childbirth, a period when the system is particularly sensitive to external impressions. Hennen‖ laid great stress on cold air in motion as an excitant of the disease, and, indeed, all authors allow, except where it has appeared to follow trivial injuries, as before noted, the agencies of cold, exposure, damp, &c., as predisposing causes. If, however, these are not allowed to become exciting causes, how can idiopathic tetanus be accounted for?—and, indeed, how can tetanus, following the before-mentioned exceedingly small injuries, originate? Moreover, the disease is known sometimes to prevail in an almost epidemic form. Thus, Mr. Spencer Wells,¶

* 'Medico-Chirurg. Trans.,' vol. vi.
† Ballingall's 'Military Surgery,' p. 269.
‡ "On the Treatment of Burns and Scalds," Author; 'Prov. Med. Journ.,' July, 1852.
§ 'Ind. Annals Med. Science,' vol. i.
‖ Hennen's 'Military Surgery,' Art. "Tetanus."
¶ "Trans. Royal Med. and Chir. Soc.," 'Lancet,' Dec. 3, 1859.

who had not seen a case for ten years, had three in his practice in one month, "showing that the nature of the wound had little to do with the origin of the disease." I am aware that in some instances of tetanus the nervous twigs leading from the wound have been found congested, inflamed, and with neurilemma softened; but this appears to be only a result of the general deterioration of the whole wound surface, consequent on that state of system favorable to the tetanic spasm, and not the cause of such phenomena, for if it were, the same appearances should always be present. Hence I think it may be justly concluded that traumatic tetanus is referable to the same causes as idiopathic, wounds only predisposing to the disease by the nervous shock, or tainted blood induced, and not acting as direct and exciting agents. The scorbutic taint exerts a powerful predisposition.

Symptoms.—Stiffness of the neck, followed by spasms, pulling the head backwards; rigidity of the lower jaw; trismus. As the disease advances, all the muscles of voluntary motion are affected; the countenance exhibits dreadful distortion—the risus sardonicus—and the violent contractions occasion excruciating pain, as opisthotonos, emprosthotonos, and pleurosthotonos prevail. A partial remittance of the spasm occurs every few minutes, but a permanent rigidity (tonic spasm) remains, always in proportion to the force, frequency, duration, and extent of the paroxysm. If the patient sleeps, the muscles relax. The pulse is accelerated, bowels costive, and respiration laborious; while urgent dyspnœa, clammy sweat, imperceptible pulse, livid countenance, and perhaps delirium, indicate a fatal result, which may take place from exhaustion or suffocation; either because the system is worn out by the violence of the spasm, or because respiration is suspended sufficiently long to cut off all supply of arterialised blood to the brain. Sometimes the fatal result takes place so suddenly that, as Dickson remarks, "while you write your notes that the patient is better he is seized with spasm and falls

down asphyxiated at your feet." Muscles are occasionally torn, and teeth and large bones, as of the thigh, have been broken by the muscular action. Tingling is sometimes felt over the whole surface, and a papular eruption, resembling sudamina, is frequently seen on the face, neck, and chest. The duration of the disease is from two to eight days, but it is said to have proved fatal in a quarter of an hour,* and has also been prolonged for a month ;† thus leading to the division of acute and chronic.

Post-mortem appearances.—These do not add much to our knowledge of the pathology of the disease. In very many cases there are traces of inflammatory or congestive action about the spinal cord and its coverings, and sometimes there is found a vascularity of the mucous membrane of the œsophagus and cardiac orifice of the stomach. In other instances abnormal appearances of any kind have not been found.

It has been called functional disease of the spinal cord, and the symptoms demonstrate that it must depend on an excess of what we term motor influence ; in other words, an unnatural excitability, an irritation, or, as Todd and Bowman designate it, "an increase of spinal polarity." This is probably aroused to excessive action, in some instances, at least, by an inflammatory or congested condition.

Treatment.—In traumatic tetanus it is recommended that the nerve supplying the injured portion should be divided, but I do not find recorded instances of the success of this operation. If it be admitted that external causes, as atmospheric vicissitudes, are the excitants of the disease, it is evident that this plan is not more worthy of adoption than amputation, as formerly so advocated by Larry. Moreover, Mr. Curling justly observes that it unfortunately happens that the tetanic condition of the spinal cord, when fully

* Copeland, 'Med. Dict.,' Art. "Tetanus."
† Curling, 'Jacksonian Essay,' "On Tetanus."

established, is mostly independent of its local exciting cause, and does not cease on removal. Numberless have been the remedies given in this disease, and cases of recovery after the use of the most opposite have been recorded, although it certainly cannot be said in consequence of their exhibition.

Depletion and depressants have, of course, been largely used, from the time of Hippocrates downwards. Tartar Emetic, bleeding, Foxglove, Tobacco, &c., have all had their advocates; but experience has, perhaps, demonstrated that less success has followed this treatment than is recorded as the effects of other remedies.

Purgatives have been used to an almost incredible extent, such as 280 grains of Calomel, with Gamboge and Jalap in proportion, given in three days. Stimulants have been admitted in even larger doses than Dr. Todd would have probably employed. Dr. Williams relates a cure by means of 110 bottles of port wine. Mr. Holt another by two gallons of brandy.* Opium has, of course, had its advocates, and as it seems to diminish the irritation of nervous excitement, Dr. Wood,† of Philadelphia, thinks the weight of testimony is in its favour. In defence of large doses of Opium it has been said, "pain eats up the remedy;" but when given in the solid form, it has been found undigested in the stomach. Dr. Carpenter ‡ relates sixteen cures out of seventeen cases treated by ice to the spine, but in other instances this application has done no good. Dr. Smith reports cases of cure after Heming's Tincture of Aconite. Dr. Pidduck,§ of Edinburgh, recommends a peculiar vapour bath, by which the head is kept always ten or twelve degrees cooler than the temperature of the body. The warm bath and the cold bath have each in turn been advocated; indeed, everything, even Strychnia, on the "similia similibus" principle, perhaps, has been tried.

* 'Lancet,' "Mirror," Aug. 18, 1860.
† Op. cit., Dec. 8, 1860.
‡ 'New York Journal of Medicine,' Jan., 1860.
§ 'Lancet,' Dec. 15, 1860.

During the past two or three years several cures have been reported from the London hospitals, and the remedies employed were Nicotine, Belladonna, Opium, stimulants, and the Indian Hemp, first introduced by O'Shaughnessy.*

In the abstract of symptoms it is stated, if the patient sleeps, the muscles relax, and in this there seems to be an indication to correct practice, and we naturally turn to Chloroform as the agent. It has not, however, been found so successful as theory would lead us to believe, and is designated by Morehead† as "treacherous and unsafe," "drawing a temporary mask over the symptoms," but "allowing the under current to flow with an insidious but certain force, till it reaches its crisis,"‡ diminishing the volume of the pulse and increasing the frequency of spasm, and if persisted in, causing death to be preceded by low, muttering delirium and coma, which "are not the symptoms of the termination of tetanus uninfluenced by remedies."§ Dr. Peet ‖ states, in his cases the good effect of Chloroform was not decidedly marked, and Mr. Jackson ¶ states, children suffering from the disease do not appear to bear it well.

Woorara, or its active principle, Curarina, has latterly been used by Bernard, Vella, and others, but similar experiments were previously made years since by Brodie, Sewell, and Morgan.** This substance appears to have a very doubtful effect when given by the mouth, as Dr. Harley states he made a pigeon swallow twenty, and a mouse thirty, times more than sufficient to destroy them, when used externally. Mr. Spencer Wells has, however, recorded an instance of recovery after this medicine, and others have occurred on the

* 'British and For. Med. Review,' 1840.
† 'Clinical Researches,' vol. ii, p. 639.
‡ Skey, "On Tetanus," 'Lancet,' July 7, 1860.
§ 'Clinical Researches,' vol. ii, p. 639.
‖ 'Trans. Bom. Med. Phys. Soc.' No. 1.
¶ "On Tetanus," 'Ind. An. Med. Science,' No. 1.
** Morgan's 'Lecture on Tetanus.'

Continent. It failed, however, when used hypodermically and epodermically (as Morson's preparation of Curarina), both under Mr. Loyd and Mr. Furgusson.*

Experience now assures us that we have no specific remedy for this disease, and that the most we can attempt is to support the strength of the patient and diminish his sufferings. This is to be fulfilled by the use of Quinine, as recommended by Morehead, by the extract of Indian Hemp, by wine, nourishment, and the occasional use of fluid preparations of Opium, aided by the anæsthethic effects of Chloroform. Regarding the propriety of using the latter agent, I have to observe that I have seen it productive of immense benefit, as the adjuvant in the treatment, but it must be administered with great caution, at lengthened intervals, with a view to moderate anæsthetic effects, and only in those instances where previous congestion, if present, may have been removed from the nervous centres by local depletion or, perhaps, cold affusion. It is well spoken of as a remedy for tetanus both by Mr. Jackson† in India, and Dr. Cotton ‡ and others in Europe.

When difficulty of swallowing occurs, most advantage will result from the administration of remedies per rectum, as frequent swallowing is a powerful excitant of spasm. Nourishment should also be given in the same way.

If a wound coexists, it can do no harm to wash this, as recommended by Jackson, with a solution of Opium, and I should also be inclined to put in practice the plan latterly brought forward by M. Pescheux, of injecting an aqueous solution of Atropine under the skin of the spinous processes of the cervical or other vertebræ.

Hennen declared he never saw a case of acute tetanus recover, Morgan makes the same statement, and all

* 'Lancet,' "Mirror," August 18, 1860.
† "On Tetanus," 'Ind. An. Med. Science,' No. 1.
‡ 'Provin. Med. Surg. Journ.,' May, 1850.

allow that recovery is the exception, and not the rule. In the present state of our knowledge of this disease I believe the practitioner who simply takes every means of supporting his patient's strength, among which relief of pain is prominent, will be the most successful.

CHAPTER II.

BERI BERI.

Causes.—The causes of this disease are not very well understood. Dr. Rogers looked upon it as a dropsical affection, commencing in the chest. Malcolmson, in his prize essay on the subject (1833), considered it as a rheumatic condition, in which the spinal cord was primarily disordered, the paralytic and dropsical symptoms being secondary results. Others have thought beri beri allied to albuminuria, of which there is no evidence. Some, as Morehead, imagine the scorbutic diathesis the predisposing cause, rendering the system prone to serous effusions on exposure to cold, particularly if the kidneys, from congestion or structural defect, cannot readily take on a compensating action. However this may be, it is certain that the affection most frequently follows exposure to cold, night land winds, damp, and atmospheric vicissitudes, and that those individuals who are in a cachectic state from the use of unwholesome food, from debauchery, long confinement on board ship or in crowded barracks and jails, and from the use of impure water, are the most liable to be attacked.

Although the cachectic are generally the victims of this malady, it yet occasionally occurs in seemingly healthy men, and in many instances has been known to prevail with almost epidemic violence among bodies

of soldiers and sailors. It scarcely ever attacks boys under adult age, and a case occurring in a female has not been noticed by any author excepting Malcolmson. This may, perhaps, arise from the military surgeon's duties being so often confined to the sterner sex, but that it does happen to females I can safely state, having seen one instance at Bhooj, in Kutch, and another at Bassadore, in the Persian Gulf. The disease is unknown in Europe, the only notice of anything at all resembling it being in Sir J. McGrigor's account of the 'Diseases of the Peninsular Army.' In the East there are several localities where the affection is more frequently met with, among which are Ceylon, the Malabar coast, the Northern Circuit, and the Persian Gulf. According to Boudin, it extends between 16° and 20° north latitude.

The influence of season in producing beri beri is marked by far the greater number of cases occurring in the rainy season, and the least in the hot, during which the temperature is most equable and vicissitudes less. The disease is considerably more common amongst natives than Europeans and among those natives who are ill-clad, ill-housed, and ill-fed, the mortality is twice as great as among the latter.

Symptoms.—In mild cases the patients are attacked with stiffness of the legs and thighs, succeeded by numbness and œdema, and sometimes paralysis of the lower extremities. In the course of a few days, swelling of the whole body, abdominal fulness, weight and tension at the præcordia, dyspnœa, starting in the sleep, and great thirst come on. As the disease advances the dyspnœa increases, the face becomes more swollen and bloated, and the lips livid; the limbs become more œdematous, and frequent vomiting, a quick, small, and intermittent pulse, scanty and albuminous urine, palpitation and sense of suffocation, precede a fatal result. Sometimes there is pain along the spine, particularly about the lumbar vertebræ. The duration of the disease may be from six hours to two or three weeks.

The urine from the first is scanty, high coloured, and contains lithatic deposit. It is occasionally albuminous from the first.

Post-mortem appearances.—Water in all the cavities of the chest, abdomen, and cranium. Cellular tissue gorged with serum. Kidneys more or less congested. Redness about the lumbar and sacral nerves has also been noticed. The pathology is very obscure, but the dropsy may be considered of a passive nature, arising under the congested kidneys (from external cold) being unable to pass off the watery constituents of a deteriorated blood, an accessory cause being checked cutaneous perspiration.

Treatment.—Colquhoun, Christie, and Hunter considered the disease due to debility, and consequently requiring a stimulating treatment. Hamilton and Malcolmson thought it congestive or inflammatory, and used Calomel and bloodletting. Ridley treated his patients with diuretics and hydragogue cathartics; while latterly, Dr. Maxwell imagines beri beri allied to cholera in its nature, and not very logically recommends Phosphorus until the motions become luminous. It can readily be understood how the different characteristics the disease may have presented at different periods, and to various observers, may have led to the different treatments above recommended, but between cholera and beri beri I, at least, can only recognise one similarity. As in cholera scarcely any two cases require the same treatment, so in beri beri each must be duly considered, and the choice of remedies made according to the symptoms presenting. Thus, diaphoretics and diuretics will always be required, stimulants will generally be of service, and, less frequently, local depletion over the kidneys will be demanded. Antiscorbutics must also be freely administered, and on convalescence a liberal diet, with porter and wine, allowed.

A preparation called "Yreak Tarrok," consisting of eleven different ingredients, the chief being Opium, Juniper, and Gentian, is a favorite remedy among

the Arabs. The natives also use a shrub called Paychora, which acts as a cathartic and hydragogue.* Malcolmson used the Ol. Nigrum made from the seeds of a plant growing in the Circars, called Malkungni (*Celastrus paniculatus*). The dose of this (also hydragogue) was twenty drops, with Benzoin, Cloves, and Nutmegs.†

CHAPTER III.

BURNING OF THE FEET.

An affection which has been so termed is noticed by different authors, and has been thought allied to beri beri, or, indeed, according to Hunter,‡ the first stage of that disease. Mr. Waring § states it occurs occasionally as an idiopathic affection, unconnected apparently with any disease; but most generally it appears as a sequence of fever, bowel complaints, rheumatism, or beri beri. It would seem, however, more allied to rheumatism. It exists in various degrees, from an uneasy sensation to the painful extreme of burning, preventing sleep, and thus destroying the general health. As the disease advances there may be distinct exacerbations and remissions, the pain, like that of one form of rheumatism, being worse when warmly covered at night. Emaciation and debility progress, from which, at last, death takes place. Mr. Playfair remarks, "the patients describe their sufferings as nearly insupportable, and there is

* Dr. Bogg, "On Beri Beri," 'Mad. Journ. Med. Science,' Sept., 1854.

† Mr. Waring, "On Indigenous Med. Plants of India," 'Ind. An. Med. Sci.'

‡ Hunter, 'On Diseases of European Sailors, &c.'

§ Mr. Waring, "On Burning of the Feet," 'Mad. Quart. Journ.,' No. 2.

scarcely a disease in which the sufferer is so speedily exhausted."* The disease is most frequently seen in Arracan, Burmah, and the more eastern settlements. Natives are those generally affected, but Europeans sometimes suffer, as happened to a sailor under my care when in the Persian Gulf.

Pathological anatomy has not thrown any light on its nature, and the treatment is empirical and unsatisfactory. Dr. McKenna found tonics most useful, and of these Arsenic most efficacious. Opium is often found necessary to relieve pain, and bathing the feet in warm salt and water is productive of the same effect. The natives use, as a local application, a mixture of salt, Oil of Sesamum, and lime-juice, and in other instances fumigate the feet with the smoke of wood and Mudar (*Calotropis gigantea*) leaves. Frequently relief is experienced by a combination of Colchicum with other remedies, or by the Tincture of Aconite applied locally; but, as Mr. Waring observes, "of all means calculated to effect a cure, none is so speedy in its operation as change of climate."

The same author states that this disease is frequently feigned by the sepoys, but, as in uncertain cases of chronic rheumatism, if the man sleep well and his appetite remain unimpaired, if he continue in his usual condition of body, without emaciation or evident diminution of strength, then the surgeon will be justified in sending him to duty.

CHAPTER IV.

RHEUMATISM.

So far from rheumatism being an uncommon disease in India, according to Mr. Macpherson,† one

* 'Madras Quart. Journal,' vol. i.

† "Analysis of latter Returns of European Troops of Beng. Pres.," 'Ind. An. Med. Science,' No. 8.

seventh part of the invaliding in all three presidencies is due to that disease. The frequency and inveteracy of rheumatism, occurring as a complication or accompaniment of intermittent fever, has already been referred to, and although cases of the acute form are less commonly met with than in Europe, still the subacute or chronic variety is, particularly amongst the natives, a daily treated disease, arising, without other existing affection, from the same causes (viz., vicissitudes of temperature) which originate it in Europe. As in other countries, so in India, the poorly fed, the ill-clad, and the dwellers in damp and unwholesome localities, are most subject to this disease.

When acute articular rheumatism does occur, the probability of complicating pericarditis and endocarditis is as great in India as in England, and are recognised by the same signs and symptoms—præcordial pain, pain at the margin of the left ribs, increased action of the heart, small pulse, shortness of breath, tremor, friction murmur, and, perhaps, intermittent action of the heart, and delirium, being the chief.

Treatment.—The alkaline treatment is efficacious in most cases of acute or subacute rheumatism arising in India, provided the disease occurs in a sthenic and vigorous habit. If in the reverse, a tonic and stimulating treatment, with, probably, antiscorbutics, will be required. In the same manner, when cardiac complications occur, those whose blood is undeteriorated by the morbific influences so universal in India will require local depletion, and as, under some circumstances, at least, the mercurial influence is favorable to the absorption of lymph-deposits, such should be mildly induced. There is not in this affection, as there is in inflammation of the liver, a contra-indication to the employment of Mercury, but it must be recollected that if any scorbutic or cachectic condition exist, the specific action of this mineral will undoubtedly favour a further degeneration of the blood, and hence must be considered inadmissible.

CHAPTER V.

DIARRHŒA.

Diarrhœa may occur from many causes which can be shortly classed thus:

1. Diarrhœa depending on congestion of the liver, and its relief.
2. Diarrhœa premonitory of dysentery.
3. Diarrhœa from scurvy.
4. Diarrhœa premonitory of cholera.
5. Diarrhœa from malaria.
6. Diarrhœa from imprudence in diet.
7. Diarrhœa from atmospheric changes.

The five first forms are considered under the respective heads of Liver Disease, Dysentery, Scurvy, Cholera, and Malarious Fever. The sixth can scarcely require much attention, as its causes and cure are self-evident. Looseness of the bowels is, however, very prevalent in India, from atmospheric vicissitudes, and especially so during the rainy season. Some individuals, indeed, may be said never to be free from a certain amount of diarrhœa, two or three loose evacuations, accompanied with, perhaps, slight griping pain, occurring every morning. In such cases it may, within certain bounds, be regarded as salutary, just as when it follows imprudence in diet. When, however, this intestinal action ceases to be confined to the early morning, it must be regarded with suspicion, and any tendency it may present towards cholera or dysentery sedulously opposed. The symptoms, briefly stated, are frequent stools, some griping, flatulence, nausea, and slightly furred tongue; and the treatment consists in great attention to diet, discarding all solid food, and administering the different preparations of Opium. If the stools be light in colour, and evidence

a deficiency of bile, the Opium may be combined with Gray Powder, or otherwise with Chalk, Aromatic Confection, or Acetate of Lead. At the same time, as in all abdominal affections, the recumbent posture, warmth to the bowels, and avoidance of motion, must be insisted upon.

CHAPTER VI.

ACUTE DYSENTERY.

Causes.—Exposure to sudden changes of temperature; imprudent change of clothing, particularly that worn over the bowels; drinking water containing certain mineral or vegetable impurities; fæcal accumulations in the large intestines; irregularities in diet; residence in ill-ventilated, improperly drained, and badly located habitations; malaria. According to Messrs. Grant, Hare, and others, malaria is a frequent cause. It has already been demonstrated that malarious influences will induce diarrhœa, and it also seems unquestionable that, in cachectic states of the system, dysentery will arise from the same cause, which, having first induced that debilitated condition, must be considered both as a predisposing and exciting agent. That malaria will, however, induce true dysentery previous to the blood having become degenerated there is no satisfactory evidence.

Contagion.—When the disease has occurred in crowded barracks, transport ships, jails, besieged garrisons, beaten and retreating armies, &c., it has been considered due to contagion. In such conditions, however, more or less of cachexia, depression, exposure, and want of proper diet, must exist, which are sufficient to account for the disease without enlisting contagion as a cause. The effluvia arising from the bodies and fæces of numerous patients, in a con-

tracted space, will undoubtedly predispose to that cachexia favorable to the development of dysentery. The scorbutic taint is also influential in inducing the disease.

Weather and season have a manifest influence in the production of dysentery, the disease occurring to a greater extent in the cold and rainy seasons. It is most prevalent in low, damp situations, in malarious localities, in crowded barracks or ships; as will be presently demonstrated, in certain hilly districts; and in those in whom scorbutic manifestations are evident.

The European soldier, compared with the sepoy, is peculiarly liable to dysentery, eleven of the former being admitted to one of the latter. Up to thirty years of age there is an increase of admissions among Europeans, the proportion of admissions then gradually diminishing, but the rate of mortality increasing with age. Up to the tenth year of residence in India dysentery is most prevalent, after that period the proportion of admissions gradually decreases. The teetotaller and intemperate are affected in nearly equal proportions. The chances of recovery are in favour of the teetotaller, but the temperate are least liable to the disease.

Symptoms.—After incautious exposure to the night air, a person awakes with feelings of nausea and griping about the navel; next, there are irregular, loose discharges from the bowels, which may continue one, two, or three days—the promonitory diarrhœa of dysentery. To this succeed irregular, griping pains, gradually becoming cutting and shooting, great heat about the rectum, and frequent straining and purging. Matter now voided consists of liquid fæces, streaked or mixed with mucus or blood; and as the disease becomes more severe, shreds or large patches of mucous membrane pass away, which are stated to resemble "washings of raw meat." The desire to stool is generally most urgent during the night; in some instances incessant, in others twenty

or thirty calls during the twenty-four hours. The amount of attendant fever is very variable, in some cases hardly exciting attention, in others evidenced by a flushed face, dry skin, furred tongue, and hard pulse. Examination of the abdomen will generally reveal more or less pain; not, indeed, the acute pain of peritonitis, but rather soreness, fulness, and tenderness, yet distinctly aggravated by pressure. Urgent and continued tormina or tenesmus, strangury or dysuria, absence of pain or tenderness in the abdomen or iliac regions, and mucous, bloody stools, unmixed with fæces, point out the rectum as chiefly implicated. A cadaverous smell, anxiety of countenance, sinking pulse, hiccough and involuntary motions, pronounce the case hopeless.

Complications.—1. *Scorbutic Dysentery.*—This is not now so commonly met with as formerly, but I had an opportunity of seeing a number of cases which occurred in an American ship in the Persian Gulf, in 1855, amongst the crew of which scurvy had prevailed during the voyage round the Cape. It may be recognised by the livid complexion of the surface generally, by the petechiæ, by the spongy, bleeding gums, and by the discharges containing a large quantity of grumous blood. To this last condition the term "hæmorrhagic dysentery" has sometimes been applied.

2. *With intermittent or remittent fevers* it is often associated, assuming in such cases a low, asthenic form. It is to this variety of the disease that the term "malarious dysentery" may be applied.

3. *As a termination* of elephantiasis and leprosy, it has already been noticed.

4. *With congestion of the brain.*—It sometimes happens that congestion of the brain is coincident with dysentery. Indeed, it has occurred to me to see a patient treated for cerebral affection, a post-mortem only revealing the primary disease to have been dysentery. This error in diagnosis could only occur in the latter stage of the affection, and the history of

the case is the real guide to correct treatment. In a very large number of instances head symptoms come on previous to death, but if the patient came under treatment early the primary disease must be sufficiently evident.

5. *With hepatic disease.*—The connection known to exist between dysentery and liver affections has been referred to when treating of the latter, and the views of Dr. Budd, who supposes this connection may be the result of absorption of phlebitis, also mentioned. It is, however, questionable if this coincidence can be viewed as result and cause, especially as those most prone to suffer from liver during dysenteric attacks are individuals who have had that organ previously diseased. However this may be, the frequent occurrence of hepatic abscess with dysentery is indisputable, and whether the opinion of Dr. Budd or of Dr. Henoch be received (the latter considering the two diseased processes as without mutual relation), the practical effect of our knowledge must be the insisting on a prompt, accurate, and daily exploration of the region of the liver.

Post-mortem appearances.—Whether it commences in the solitary glands of the large intestines, or whether it commences in the mucous coat of the latter or the small, the disease is essentially inflammation, which may be diffuse, ulcerative, purulent, hæmorrhagic, or even gangrenous, according to circumstances. Thus, the autopsy will reveal vascularity, vivid, inflammatory redness, ulcerations, and sloughing, either throughout the whole intestinal tube, confined to a certain portion, or scattered here and there, with spaces presenting a perfectly healthy appearance. Often the serous membrane becomes implicated, and the usual results of peritonitis—effusions of serum and lymph—take place. In dysentery complicated with liver disease Martin has observed the cæcum and rectum most affected. As Dr. Bleeker remarks, the dysenteric process consists of four clearly defined stages. First, hyperæmia and retention of blood in

the mucous and submucous membranes. Secondly, deposit of exudation beneath and in the membranes. Thirdly, expulsion of the exudation by ulceration. Fourthly, cicatrization.

Treatment.—The mortality from this disease even now justifies the remark of Robert Jackson, who regarded it "as one of the most important of the maladies occurring among troops;" and of Sir James McGrigor, who designated it "the scourge of armies." There is no disease for which "early treatment is more urgently required."

In the mildest form of the affection, where griping pains are complained of at intervals, followed or accompanied by the discharge of slightly bloody stools, fomentations, rest in the horizontal posture, demulcent drinks, and a pill every three hours, composed of Ipecacuanha, Blue Pill, and Opium, will frequently effect a cure in a few days. It must be recollected, however, that cases having at the commencement the mildest character are occasionally found to change in the course of a few hours, and exhibit a very severe type.

In the more acute forms of dysentery, when the calls to stool are very frequent, the pain cutting, the abdomen tender, and the constitution good, the application of a large number of leeches to the abdomen is called for, while Calomel should be substituted for the mercurial before mentioned, the recumbent posture, hot fomentations, and demulcent drinks being insisted upon.

Thus, bloodletting and Mercury are the chief agents in treating this disease in its earlier stages. It is impossible to fix an arbitrary rule to regulate the former. Generally, excepting in very robust, latterly arrived individuals, the lancet must not be thought of, but the constitution, state of the skin and pulse, degree of abdominal tenderness, duration of the attack, and length of residence in India, must guide the medical officer in his treatment of any particular case; and it must be constantly borne in mind that a

too great reduction of the vital powers is always to be dreaded in this country. "In medio tutissimus." And thus bleeding must not be repeated, after the manner of Robert Jackson, "until all that was expected from it had been obtained." Tartar Emetic has been recommended as a remedy which may be employed with equal benefit and less constitutional loss than follow depletory measures, but practically the remedy has not been found efficient.

Regarding the efficacy of Mercury in this disease, very contradictory opinions have been expressed. Sir J. McGrigor said it was most useful in those cases complicated with liver disease; but, as already pointed out, it is very questionable if Mercury does not excite more evil in the latter organ than the benefit which results can repay. The older writers, as Pringle, James Johnson, and Annesley, salivated their patients; but a recent authority, Morehead, states, "the practice has been most generally and certainly most properly abandoned." He, however, recommends 10-grain doses of Calomel at bedtime, and gives certain symptoms as guides to the repetition of the dose. A very similar treatment, by 10-grain doses of Calomel, is recommended by Martin; this author, at the same time, stating, "Mercury ought not to be regarded as a necessity in the treatment of dysentery." Annesley also says, "I believe these effects (mercurial) are not necessary to the cure of disease," but he recommends large doses, and states, if the mouth become affected after this, "the circumstance may be looked upon as favorable." I have always found such to be the case, and, indeed, in my own person the disease has yielded the moment the gums became slightly affected. I cannot, however, recognise the necessity for large and repeated doses of Calomel, as recommended by the authors quoted. Such exhibitions are frequently followed by salivation and consequent amelioration of symptoms, but I am persuaded the same results may be achieved by milder and less heroic methods of treatment.

It may, however, be argued that these doses are not given with a view to the specific effect, but to unload the liver, to discharge vitiated and acrid secretions and fæcal matter, to eliminate morbid material from the blood, and for the so-called sedative effect of the Calomel. To this I would shortly reply, that purgation is better effected by a different agent; that risk of hypercatharsis is thereby avoided; that Calomel increases the secretion of at least as much bile as it expels, thus not directly unloading the liver; and that the sedative action of Calomel I believe to be chimerical, or, at all events, possessing no curative power.

The fact is, Mercury appears to be essential for the cure of many cases of dysentery, but over-mercurializing and over-dosing must be carefully avoided, as tending to produce hypercatharsis and aggravation of the disease as an immediate effect, and to retard convalescence and induce cachexia as a remote. Thus, Blue Pill is recommended in trivial cases, and Calomel in severe, small doses instead of large being earnestly advised.

It is also to the earlier stages of the acute and unmixed form of the disease that I would limit the administration of mercurials. Mercury will aggravate the symptoms in the more advanced stages, particularly when there is hectic fever or presumed extensive ulceration of the intestinal tube. In such cases it is found to hurry on a fatal result.

It would scarcely be imagined that a disease essentially inflammation of the mucous membrane of the bowels could ever have been treated by purgatives. Yet this has been sanctioned by such men as Twining, Bampfield, and Pringle. It is, however, erroneous in theory and unsuccessful in practice, and now deservedly abolished.

I do not, however, wish to be understood as objecting to purgatives *in toto*. Stating them, as a rule, to be inadmissible, I am yet fully aware that it is sometimes necessary to relieve a tumid abdomen at the commencement of a dysenteric attack. Indeed, I make

a point of inquiring if the bowels have been confined previously, and, if evidence of retained excretion exists, commence the treatment with the most emollient of all purgatives, Castor Oil, perhaps combined with Tinct. Opii.

If, during a case of dysentery, tenesmus is urgent, with much pain at the lower part of the rectum, an enema or suppository of Opium sometimes affords much relief. With this also may be combined the Acetate of Lead, or in some cases simple injection of warm water appears most soothing. Mr. Hare, of the Bengal service, has had success in treating dysentery by large injections pumped into the bowels till the patient complains of distension, the fluid acting as an internal fomentation to the parts; but the tube generally hurts the rectum.

Other remedies have been from time to time vaunted as almost specifics in the treatment of dysentery, the principal of which is Ipecacuanha. This was given by Pringle and Twining in scruple doses, and Mr. Docker * (2nd batt., 7th Fusiliers) has latterly reported great success in the Mauritius by the use of still larger doses, even up to sixty grains. This, however, is but the revival of an obsolete practice brought by Piso from the Brazils, and who treated a son of Louis XV successfully. It is also lauded by M. Balmain,† and was pursued in 1813 by Playfair,‡ of the Bengal Medical Service.

In the 'Madras Quarterly Journal,' No. 111, 1861, is a lengthy paper by Mr. Cornish, on the use of large doses of Ipecacuanha in dysentery, who embodies the opinion of some thirty-three medical officers who have practised the method in consequence of a circular from the Inspector-General of that Presidency. Of this number twenty-two speak decidedly as to its specific efficacy, eight speak less enthusiastically, and three rather condemn it.

* 'Lancet,' July, 1858.
† 'Mem. Med. Soc. of Lond.,' vol. v, p. 210.
‡ 'Ed. Med. Surg. Journ.,' vol. ix, p. 18.

Mr. Low, who took the remedy himself, endeavours to account for its good effects by "its sedative action on the system of sympathetic nerves, whereby an anti-peristaltic action of the intestines is effected, and irritation quelled, while it specially influences the secreting organs in promoting their activity."

The general advice is that the large dose should be preceded by Opium, which, it is said, prevents its debilitating the patient, and that it is most efficacious in acute cases. In the cases in which I have used this remedy it has certainly checked the discharges and pain in a wonderful manner, but, owing to the nausea and distress it occasions, it is difficult to prevail on most patients to continue it. If they can bear it, the treatment may be depended upon in acute cases, but in chronic it affords only very temporary relief, scarcely in correspondence with the distress it occasions.

Opium has also been advocated in large doses, and Dr. Bleeker * states Muriate of Morphia is even in the earlier stages one of the best remedies, diminishing the otherwise unbearable pain, moderating the peristaltic action of the intestines, taking away the dryness of the skin, promoting copious perspiration, and procuring wholesome sleep. Dr. Bleeker recommends quarter-grain doses three times a day. The same author observes stringents and tonics, excepting Quinine, do more harm than good, although the Tinct. Benzoin. Comp.† has occasionally been found serviceable. Chloroform has been recommended by Dr. Lownds (Bombay Service), administered internally.

Other remedies which have been vaunted are Castile Soap in masses the size of a nut;‡ stranger still, Vitrium Antimonii Ceratrum, prepared from Glass of Antimony! § Dr. Brown's "Chlorydyne" is sometimes beneficial.

* 'Ind. An. Med. Sci., vol. i.
† Mr. Ellis, 'Lancet,' vol. ii, 1856, p. 221.
‡ Ass.-Surg. Govett, 'Lancet,' Dec. 29, 1855.
§ Dr. Pringle's 'Medical Essays,' vol. v, "Dysentery."

The treatment of hæmorrhagic or scorbutic dysentery must be conducted on different principles to those laid down for the cure of purely inflammatory disease. In these instances Mercury is inadmissible, and endeavours must be directed towards altering the cachectic condition. In such cases tonics and astringents, as Quinine, Sulphate of Iron, Acetate of Lead, Tannic and Gallic Acid, and dilute Sulphuric Acid, in combination with opiates, together with liberal but bland diet and port wine, are the remedies.

In dysentery complicated with liver disease mercurials are also contra-indicated. Here tonics and astringents, as above, will be required.

Where there is reason to suppose malarious taints exist, the due administration of Quinine is called for.

CHAPTER VII.

CHRONIC DYSENTERY.

It very frequently happens, when inflammatory action has subsided, that soreness remains in some part of the abdomen. Sometimes this may be covered by the finger, at others it occupies a much larger space. If the stools are occasionally bloody or muco-purulent, the probability of an unhealed ulcer is great, otherwise the tenderness may be due to thickening of some part of the bowel. It is this condition to which the term chronic dysentery may be applied, and, indeed, in very numerous instances the disease assumes more or less of a chronic character from its commencement.

Under these circumstances the application of repeated counter-irritants, as blisters or Tinct. Iodinii Comp.; regulation of the bowels by Castor or by Sulphur, in combination with Bitartrate of Potash; the use of the Bael fruit, so favorably reported upon by Mr. Grant, Dr. Ward, and others; the exhibition of

Quinine, Sulphate of Copper and Iron, Acetate of Lead, preparations of Catechu and Pomegranate Bark, with Opium, will prove the best treatment. These remedies, moreover, should be frequently changed, as they appear to act most beneficially during the first few days they are taken.

As it is sufficiently proved that the neglect of proper diet both retards the progress of cicatrization and tends to extend ulceration, only that which is unirritating and bland must be allowed during both acute and chronic dysentery. Jellies, animal broths, and solid farinacea, with occasionally well-cooked fowl or flesh, form a sufficiently wide choice, and it cannot be too often impressed on the patient that oversight or neglect regarding diet will negative all medical treatment. As Dr. Ward states, the first thing to insist upon when treating dysentery is rest in the recumbent posture, by which the bowels are supported and kept quiet and bland diet absorbed. Patients who have been moving about are frequently at once relieved by rest, before any medicine has been given.

In scorbutic or cachectic dysentery the pulp of ripe grapes may be taken abundantly and with advantage, or the Citrate of Iron may be used if the gums become spongy. These means not succeeding, change of climate must be sought.

CHAPTER VIII.

HILL DIARRHŒA AND DYSENTERY.

The presence of diarrhœa at hill stations has long been a matter of notoriety, the disease being known as "Simla trots." At that station, according to Mr. Grant,* few persons at the Himmaleh mountain can-

* 'On Hill Diarrhœa and Dysentery.'

tonments escape one or more attacks in the course of the season, and the malady is not confined to persons of broken-down health or who have suffered from fever, but residents in sound health and in the prime of life are also affected.

Causes.—The chief causes are undoubtedly great and sudden vicissitudes of temperature, aided by a cold, moist atmosphere, by which cutaneous exhalation is checked, leading to internal congestion, impaired circulation in the portal system, and derangement of functions. The scorbutic diathesis, trees, promoting damp exhalation, may have an influence in the induction of this disease. In other instances it may depend wholly or in part on malaria rising from the ravines, in a form too diluted to cause fever, and giving rise to bowel complaint instead. The extreme probability of this is proved by the disease called "Dhobees colic," which attacks the washermen who pursue their avocations in unhealthy ravines. The want of proper sanitary regulations will certainly increase the tendency to this disease more on hill stations than on the plains, where the sun dries ordure, &c., before it can putrefy. Crowded barracks will induce the disease also.

The rainy period is the time when hill diarrhœa mostly prevails. Persons of strumous habit are most likely to be attacked. New arrivals are more liable than old residents.

There are some hill stations, as the Neilgherries and Mahableswar, where this disease is seldom, if ever, seen. On Mount Aboo it is never of the inveterate, almost epidemic, character which it has presented on the Himmalehs, and the reason of this is not clearly apparent. That mere elevation has any great influence on the induction of the malady there is no good reason for supposing, but it would appear that on inter-tropical mountains, as those just named, the vicissitudes of temperature are less, the power of the sun greater and more equable, and hence the visitor from the plains below undergoes a less sudden tran-

sition than he would do if sojourning in the northern regions of the Himmalehs.

Symptoms.—Painless diarrhœa occurring in the morning. Stools passed are light in colour, contain air-bubbles, and have been termed "lienteric." As the disease advances, loose stools are also passed in the evening, but the patient, probably continuing to feel well, takes little notice of the commencement. The calls to stool are urgent, but the fæces are passed without straining, faintness, or pain, and are succeeded by a feeling of eomfort. The most distressing symptoms are fulness and distension of the bowels by flatus, eructations having a slight odour of sulphuretted hydrogen, and other dyspeptic manifestations. The stools, however, are not offensive. The pulse is weak, tongue furred in the centre, and gums probably eongested, but appetite not much impaired.

If this condition, which has been called diarrhœa alba, be not checked, it passes into diarrhœa eachexia; the stools become more numerous, still, however, maintaining their yeasty appearance; progressive emaciation, from want of assimilation and nutrition, takes place. The mind beeomes weak and fretful, and hectic fever occurs, until at last, dropsy having appeared in the extremities and abdomen, the patient dies exhausted.

Post-mortem appearances. — Bowels pale and blanched; coats of intestines atrophied; mesenteric glands and mucous follicles enlarged; mucous membrane soft, with serous exudations beneath; inflamed spots on the peritoneum; liver pale; hepatie abseess rarely concomitant.

The affection appears to depend on determination to the intestines and deficient secretion of bile, arising from great vicissitudes of temperature, as from the change from the plains to a mountain region, or as occurs on the latter.

Treatment should be early and prompt. The diet must be bland, but both farinaceous material and animal broths may be allowed. Too hot drinks must be interdicted. Gray powder, with the com-

pound Ipecacuanha preparation, or with rather full doses of Opium, should be exhibited; the patient kept in the recumbent posture, hot fomentations applied to the abdomen, and the same part periodically well rubbed. If these measures do not succeed, Grant recommends a combination of aromatics and astringents. The Sulphate of Copper and Acetate of Lead will sometimes produce much benefit. The Nitro-muriatic Acid and Taraxacum has also been eulogised. If the disease prove obstinate, and cachexia or hectic threaten, change of climate will alone effect a cure.

Hill dysentery may be a sequel of diarrhœa, or it may arise, at first, with little or no premonitory symptoms. Its causes are essentially the same, but the symptoms differ considerably, inasmuch as the affection is attended with griping pain and abdominal soreness and tenderness, and the stools, although still of the yeasty character, are mixed with more or less slime and blood. I believe the occurrence of pain is the sign that the disease has advanced to dysentery, as it is one of the most characteristic marks of simple diarrhœa that the evacuations are passed without pain. In some instances there is a sensation of uneasiness in the right hypochondrium, not of fulness, but rather the reverse; and, indeed, this is occasionally confessed to by patients with diarrhœa.

The treatment of hill dysentery must be conducted on general principles. If the disease commence in an acute form, the remedies recommended for acute dysentery should be had recourse to, by which the affection may, perhaps, be cut short; but if, as generally happens, the symptoms come on gradually and succeed more or less diarrhœa, mercurials will be inadmissible, as tending to aid in the induction of that cachexia which will the sooner arise, accordingly as its cause is the debilitating diarrhœal discharge or the more weakening dysenteric evacuation.

If mercurials cannot be employed, opiates and

Quinine are the chief remedies; and if these, with attention to diet and the recumbent posture, do not quickly alleviate, no resource, except change of climate to the plain and sea-coast, remains.

CHAPTER IX.

FEBRICULA OR EPHEMERAL FEVER.

Space need not be devoted to the consideration of this, the simplest form of febrile disturbance. It does not depend on specific poison, but is caused by cold, vicissitudes of weather, and exposure. The symptoms are briefly chills, alternating with flushes, headache, furred tongue, and scanty lithatic urine; and the treatment consists in the administration of diaphoretics, diuretics, and occasionally purgatives.

CHAPTER X.

MOON PARALYSIS.

It has frequently happened that persons sleeping in the rays of the moon, and particularly on the deck of a vessel at sea, have found themselves paralysed on one side when attempting to rise. Sometimes a leg or arm only suffers; and at others pains and aching in the parts, without loss of motor power, is only complained of. I have had numerous instances of the latter under my notice, and several of partial paralysis of one limb, either leg or arm. I have,

however, always considered exposure to cold night winds and dew, sleeping to windward of a sail, under a wind-sail, or near a port-hole, and consequent rapid passage of air over the probably perspiring surface, as the cause of the results noted. Indeed, I have known the same to occur from individuals sleeping in such positions on nights when the moon was *not* visible. Friction, warmth, stimulating liniments, and rest, are the means of relief. In one obstinate case I employed a blister.

Section V.—Diseases depending on Specific Poison as a chief cause.

CHAPTER I.

CHOLERA.

Has been called epidemic, spasmodic, Indian, Asiatic, blue, pestilential, &c.

Causes.—Whatever lowers the vital powers will predispose to cholera. The depression of the nervous system following intoxication; long and fatiguing marches, and the exposure consequent thereon; damp, filth, destitution; crowded barracks; drought; contagion.

With regard to contagion being a cause, there are very varied opinions. Martin has never seen anything which warranted the belief; but whether the disease spreads from direct contagion or atmospheric causes, there are abundant instances of its passing through a camp or city in such a manner as can only

be accounted for by the almost demonstrated fact that a specific cholera-poison exists.

From these numerous instances may be mentioned the ravages committed by cholera among the European soldiery at Kurrachee, in 1846; among the troops at Scutari, in 1855; among the French, on their advance into the Dobrudscha, as detailed by M. Scrive; and the course of the disease as it occurred under my own observation, when attending cholera patients in South Staffordshire, in 1849.

Therefore, as Dr. Arthur observes, there must be some specific exciting cause; and the question arises, What is that cause? Is it to be looked for in the atmosphere, as a something originating from the mode of life over which we may have control, or as conditions existing beyond our efforts to modify? Is it to be sought for in the water we drink, or in the food we eat?

McCulloch, as far back as 1827, wrote:—"Cholera belongs predominantly, if not exclusively, to the same climates, the same soils, or generally to all those countries in which other diseases of malaria abound;" and, afterwards, he remarks in reference to the climate of England, that this disease is common where fevers are common, and rare where they are rare. Since that period, the theory of the affinity of cholera and ague have found able supporters in Drs. Rose, Cormack, Murray, Royle, Bird, Armstrong, Bell, Stewart, Smart, M. Scrive, Billing, and others, who have all advanced much the same arguments first promulgated by McCulloch. That malarious influences are powerful predisposing causes, any one who is conversant with the records of campaigns must allow; but that such influences will give rise to the specific cholera-poison does not appear correct, as we cannot in that manner account for its outbreak on board ships at sea, where the crew, with a clean hold, were necessarily removed from terrestrial emanations.

Professor Wells, in his 'Pathologica Indica,' attributes cholera to sulphuretted hydrogen; but numerous

epidemics have occurred where the presence of this gas was neither demonstrated nor expected.

The theory that cholera had its origin in some peculiar condition of the atmosphere seems to have been first proposed by the French physician, Arago, who afterwards concluded the absence of ozone to be the *fons et origo mali*. Faraday further states, this is connected with a state of negative electricity; which pecularity is always associated with cholera. Epidemics have, however, arisen where neither one nor the other of these peculiarities could be ascertained. Herepath, again, refines on this theory, and believes that in Asiatic cholera the stomach is strongly electro-negative, and the gastric mucous membrane secreting a free alkali; and hence, as a curative agent, recommends sulphuric acid.

Cameron, of the Royal Artillery, considers it a nervous affection, because no post-mortem morbid appearances have been found; and Dickson sees in it the same disease Mr. Travers describes as constitutional irritation. Chevers, again, opines there is great reason for supposing the cholera-poison to be the same disease as heat-asphyxia, in a less intense form. Dr. Musgrove considered it due to a loss of the watery particles of the blood. Others, as Drs. Acland,* Snow,† Carpenter,‡ Allison,§ Pettenkofer,‖ Routh,¶ Sutherland,** and Bidie,†† consider the cholera evacuations to be the source of the propagation of the disease, either by water or otherwise; and in the writings of these authors may be found powerful argu-

* Acland, 'Memoir of Cholera in Oxford.'

† Snow, 'On the Mode of Communication of Cholera.'

‡ Carpenter, "Impure Water a Cause of Disease," 'Ass. Med. Journ.,' Oct., 1854.

§ Allison, "On Cholera," 'Ed. Med. Journal,' 1854.

‖ Pettenkofer, 'Mode de Propagation du Choléra.'

¶ Routh, "On Fermenting Alv. Evac.," 'Sanitary Review,' No. 6.

** Sutherland, "Rep. on Cholera," 'Blue Book,' 1855.

†† Bidie, "Etiology of Cholera," 'Mad. Med. Journ.,' No. 1.

ments and facts in favour of this view. After mature consideration of this subject, I cannot avoid coming to the conclusion, long since suspected by Liebig, and demonstrated by Thiersch,* of Vienna, that the matter of cholera evacuations during its decomposition has a peculiar poisonous quality developed, which will, if introduced into the healthy body, induce the disease again. I am not, however, prepared to agree with the opinion of Dr. Gibb,† that diseases have the power of propagating themselves when opportunities are afforded for the escape of their peculiar virus, which may have lain dormant for years; although, indeed, that gentleman brings forward the opening of a small-pox cemetery, 214 years old, at Quebec, as the origin of an epidemic of the same affection.

If it be allowed that the evacuations of cholera can propagate the disease, the cause of its primary origin is still unsettled; but, as Miss Nightingale remarks she has "smelled" variola forming in different localities, so I believe that cholera will arise where sanitary regulations are neglected, where dirt and filth abound, and where numbers are congregated in a small space, whether such be a city, a village, a barrack, a hospital, or a ship. That malaria, hot and oppressive weather, particularly when combined with moisture, fatigue, improper diet, or want of sufficient food, intemperance, and exhaustion, will aid in the induction of the disease, cannot be questioned; but that they will excite true cholera is not sufficiently proved.

The precise nature of the poison of cholera, of variola, of measles, of scarlatina, of malarious fever, of pestis, of yellow fever, is now, and will probably for ever remain, a complete mystery; but that the first may be generated under certain necessary conditions, and that it may also be propagated by diseased alvine evacuations, scarcely, I think, admits of doubt.

Cholera, as the general rule, is most prevalent in

* 'Medical Times and Gazette,' 1853.

† Gibb, "On Smallpox in Quebec," 'San. Rev.,' No. 2.

India during the hot and rainy seasons, although epidemics occur at all periods of the year. The exemption of some localities from the ravages of this disease is somewhat remarkable, and appears to depend on more than one cause. Thus, the absence of the disease from the cider districts of England, although epidemic in adjoining counties, has been considered by Dr. Headland due to the prophylactic influences of the vegetable acids, there so generally consumed; probably to their septic influence, counteracting fatal and rapid degeneration. The fact of cholera not occurring in Birmingham (as in 1849), when the surrounding manufacturing districts were decimated, has been attributed to the good natural and artificial drainage there existing.

In like manner, there are towns and villages in India where cholera seldom, if ever, occurs; and such would also appear to have good natural drainage, and to be less notorious for bad conservancy and the neglect of sanitary regulations than most other places.

Intertropical hill stations have been found remarkably free from the disease; which fact has been previously referred to in the chapter on Hill Sanitaria, This subject is well deserving of further investigation.

Symptoms.—The disease commences in two ways; suddenly, or after painless diarrhœa. The seizure often occurs during the night; and there is frequently, from the first, marked depression of respiration and circulation. Spasmodic griping in the bowels is most felt, soon followed by bilious purging and vomiting. These evacuations quickly change to the well-known almost odourless rice-water dejections, while, at the same time, severe cramps, commencing in the fingers and toes, rapidly extend to the calves, thighs, and abdominal muscles. There is great thirst, and a feeling of burning heat in the stomach; urine, if passed, is albuminous; and as the disease advances, the eyes become sunken and surrounded by a dark circle, the features sharpened, the extremities cold. Blueness of the surface cold perspiration, corrugated integument of the

fingers, thready pulse, suppressed urine, difficult respiration, husky voice, sickly odour, cold breath, and jactitation, are symptoms denoting fatal collapse. The duration of the disease may be from one hour to two days.

When that favorable symptom, passing of urine, takes place, the fluid is still albuminous, but contains little or no urea. Various kinds of minute fungi have been found in the stools; and although several hypotheses have been formed regarding this appearance, no light has been thereby thrown on the disease.

Post-mortem appearances.—The temperature of the body has been known to rise one or two degrees after death. Spasmodic contractions have continued for an hour. The brain and membranes are generally congested. The left side of the heart frequently empty. Stomach pale; small intestines sodden, with frequently red patches resembling erythema. Minute glandular apparatus, infiltrated with a creamy substance, named, by Drs. Lyon and Aitkin, "the sago-grain" appearance. Large intestine presents nothing remarkable, excepting that the solitary glands appear prominent; kidneys congested; bladder contracted. As before stated, the peculiar poison inducing this disease is a complete mystery.

Treatment.—Even in a disease such as dysentery, where the post-mortem appearances and pathological indications of treatment are clear, the most opposite remedies have been advocated. What wonder, then, that in a disease so rapid and dangerous as cholera, where so little light is derived from pathology, that multitudinous and adverse remedies are recommended? It would, indeed, be difficult to name a medicine which has not, at one time or other, been proposed. From Epsom Salts and Castor Oil to Catechu and Tannin, from Ammonia and brandy to Tartar Emetic and Ipecacuanha, all have been advocated, tried, and found wanting.

Those who considered the disease due to malaria have advocated Quinine. Those who regard it as a

nervous affection have used Chloroform. Others have made their patients drink cold water to the *finale*. Dr. Gull used the wet sheet. Dr. Parkes, with greater theoretical probabilities of success, used the warm bath. Some place faith in Sulphuric, some in Nitrous or Nitric Acids. Dr. Graves brought forward Sugar of Lead and Opium as a never-failing remedy. Raspail, in Paris, asserted Camphor to be an infallible cure. From an idea that the salts of the blood were deficient, arose the plan of saline enemata and venous injections. Bleeding and Calomel have, of course, had their full trial. Neither have Croton Oil and ox-gall, Castor Oil and Sulphate of Magnesia, with other drastic and mild cathartics, been forgotten. Latterly, however, the height of credulity has been required by a German at Calcutta, who advertised the certain cure of cholera by inoculation with Inf. Quassiæ, and, indeed, wrote a pamphlet thereupon! And yet the latter, equally with all the former, refers to what *he* considers a most successful treatment.

The fact is, for this disease there is nothing yet discovered which has the most remote specific power over it; and he will best treat the malady who, guided by the symptoms presenting in individual cases, so combats the tendency to death. As Mr. Macpherson observes, "Successful treatment of cholera depends much on the care that is taken of the patient, in nursing and supporting him; not interfering with him too much, but carefully watching and treating the symptoms that may arise." The *nimia diligentia medici* in cholera has added little to our reputation, or to the preservation of human life; and it is well to leave nature pretty much to her own resources, till a rational treatment, based on a well-understood pathology, is discovered.

In the premonitory diarrhœa, time should not be lost, but a scruple of the compound Chalk and Opium powder may be given every three hours, or the compound Chalk powder, with aromatic confection and Tinct. Opii. In other instances the Acetate of Lead,

in five-grain doses, with small quantities of Opium and stimulants, if the state of the circulation demands them, are the best remedies. Hot animal broths may also be offered, and warmth applied to the bowels. *Whatever treatment is adopted, the recumbent posture must be insisted upon.*

When the second stage is present, I prefer prescribing Opium Tincture and Chloroform, in from ten to twenty minim doses every second hour; cold champagne, port wine, or if not available, brandy; strong beef tea *ad libitum*, either cold or warm, as the sufferer prefers; the same used as a frequent or hourly injection; an occasional dose of some diuretic, as nitre; frictions to the limbs and sinapisms over the abdomen, spine, and lumbar regions. If available, I should also use the hot-air bath, as found beneficial at Scutari by Mr. Fraser.

I only mention bloodletting to condemn it. I have never seen Calomel productive of benefit. The hot bath, as stated by Morehead, is plainly injurious. Emetics must be so, and purgatives to as great an extent. The inhalation of oxygen gas, which I administered to numerous cases in 1849, had no beneficial effect; and in all probability the use of oxygenated drinks, as recommended by Dr. Lownds before the Bombay Medical Society, February, 1860, will ultimately be spoken of in the same terms.

The practice of giving Opium in large doses is one I cannot recommend. Opium is not an anæsthetic, except by the production of stupor; and I do not understand how its action can benefit cholera, in which affection there is a deficiency of vital power. Small doses, however, in consequence of the tolerance of the drug which all painful diseases induce, *have an excitant effect*, and seem to exert a beneficial action; but when very large quantities are exhibited, it appears questionable if the disease or the remedy kills the comatose patient.

From this sketch it is evident that I do not recommend either an eliminative, purgative, or depletory

treatment. Considering that most cases require rather stimulation than otherwise, I endeavour in each individual case to use the means of cure which appears best calculated to obviate the tendency to death; *in short, I treat symptoms.*

After attacks of cholera, recovery is retarded by gastric and intestinal irritation; by the supervention of typhoid fever, often attended with minute papular eruption, and terminating in coma, or by inflammatory reaction in different organs. These results have been divided, by Grisolle, into inflammatory, comatose, adynamic, and gastric. The two latter forms have been most frequently observed in India, and the correct treatment can only be inferred by the peculiar symptoms present.

When epidemic cholera occurs in camps or on board ships, the most effectual means of checking its progress is change of locality. But when it follows the line of march, and is aggravated or perhaps developed to a certain extent by physical fatigue and intense privation and exposure, or by mental and physical suffering, rest and repose on a healthy site is demanded. It is a fact long since noted that the Bedouin Arabs, always on the move, but scarcely ever subjected to the spasmodic exertions which soldiers have to undergo, rarely suffer from the affection.* Accordingly, the plan of change of locality, when epidemics of cholera occur, has been extensively and successfully followed in India; amongst which the instance of her Majesty's 52nd Regiment at Lucknow, in 1857, may be mentioned, who literally marched away from the disease.†

* 'Medical Logic,' p. 157.
† 'Lancet,' June 5, 1858; Mr. Dempster's communication.

CHAPTER II.

HYDROPHOBIA.

"Hac rabiosa fugit canis, hac lutulenta ruit sus."

The above line of Horace may be applied to most cities, towns, and villages in this country. When, therefore, the great liability of a tropical climate to excite canine madness is recollected, it ceases to become a matter of surprise that hydrophobia is more frequently seen in India than in Europe.

Causes.—The saliva from the mouth of a rabid animal is undoubtedly the poisonous agent, and it is probable that, by its influence, the whole fluids and solids of the body become diseased. It is also tolerably well authenticated (M. Putegnat relates cases of the kind) that the bite of a simply enraged animal, especially if the venereal appetite existed at the time, may be followed by hydrophobia. It would also appear from Mr. Hutchinson's papers, published in the 'Lancet,' that contact with a rabid dog's saliva, without any wound or abrasion, may engender the disease. Thus, Sir B. Brodie mentions a case ('Lancet,' 1833-4) where the man died, but the dog remained well. Mr. Knowles reports a case of hydrophobia from the bite of an irritated but not rabid animal. Dr. Watson mentions an instance where the tooth of the dog merely indented the hand; and Gilman, the fact of a man who was licked near the mouth by a rabid animal, and went mad.

That a very slight scratch or wound, whether inflicted by the teeth or claws, on which saliva may have fallen, is sufficient to induce the disease, there is abundant evidence, in the writings of Youatt, Breschet, Majendie, and others. Youatt and Portal consider the saliva of a rabid animal cannot touch a mucous membrane without danger.

The latent period of hydrophobia is very variously stated. The majority of cases occur between five weeks and eighteen months;* but the affection may come on in three or four days afterwards,† or not until three ‡ or even twelve years have passed away.§

Symptoms.—There is, in most cases, a slight pain or uneasiness in or near the wounded part, but this does not always occur.‖ Sometimes it becomes red, swollen, and suppurates; at others cold and livid. There is also, generally, numbness and stiffness of the affected limb, vague feelings of uneasiness, oppression, gloom, irritability, frightful dreams; and in many instances, when the individual is aware of the injury experienced and the probable consequences, intense fear and dismay. Oftentimes there is considerable febrile action and vomiting. After a few hours or days, the patient complains of stiffness of the neck, and slight embarrassment of respiration, which suddenly passes into suffocating spasm, most probably on some occasion when the individual attempts to drink. At first these spasms are excited only by the attempts to swallow fluids; afterwards the sound or sight of fluids, any motion near the sufferer, the movements of spontaneous deglutition, even a draught of air or a look from a bystander, is sufficient to excite them. During these paroxysms all the muscles are convulsed, the face is blue and turgid, and the eyeballs protruding. Sometimes the patient rushes violently about the apartment in a state of maniacal fury, staring wildly, and "clawing" at the throat, as if to remove some obstruction there. In some cases the patient is remarkably silent, and refuses to answer all questions; in others there is loud and garrulous talking, although the mind often remains unclouded to the last. In all cases there is a copious secretion of

* Watson's 'Lecture,' vol. i, art. "Hydrophobia."
† Pickell, "On Hydrophobia," 'San. Rev.,' No. 12.
‡ Case by the Author, 'Trans. Bombay Med. Phys. Soc.'
§ Pickell, op. cit.
‖ Peet, 'Trans. Bom. Med. Phys. Soc.'

viscid mucus about the mouth and fauces, exciting frequent hawking and spitting. There is often febrile action, with hot, dry skin and parched tongue. Occasionally the surface is bathed in cold perspiration. Aversion to anything white has been frequently noticed. In some cases a deceitful calm occurs before dissolution, after which the convulsive paroxysms come on with increased rapidity or violence, in one of which the patient dies exhausted or asphyxiated.

It is, however, seldom that all these signs and symptoms are fully manifested; and although all observers agree in the main phenomena of dread of liquids and dread of air, secretion of viscid mucus, and hawking and spitting, still the variety in minor points in different subjects is such, that in this respect hydrophobia, as has been said of other diseases, may be truly designated a protean malady.

Diagnosis.—The eighth pair are the nerves chiefly affected; and consequently the muscular action is confined in many instances to the neck, larynx, and pharynx, and, even if more universal, is of a clonic character. The continued hawking and spitting, with the aversion to fluids, are of great value as diagnostic marks. In tetanus, with which the disease may be confounded, there is permanent muscular rigidity, increased by paroxysms of tonic spasm; none of the spitting of hydrophobia, no fear at the sight of liquids, and no sensorial affection.

In the first stage of the disease, before the dread of water sets in, it has been mistaken for common sore-throat, or for a cold or feverish attack, and for rheumatism.

Hysteria, among other of its vagaries, occasionally mimics hydrophobia. I latterly attended a case where the symptoms sometimes resembled those of tetanus, and at other times hydrophobia. The history of the case, however, the age, sex, and history of the patient, the globus, and other hysterical phenomena, cannot fail in establishing a correct diagnosis.

A species of false hydrophobia has also been recog-

nised, occurring in individuals who have been bitten by dogs, and apparently brought on by fear. Cases simulating hydrophobia are related by Dr. McCarthy, 'Lancet,' September 20, 1833.

Lastly, it has been denied that the disease exists at all, by the late Sir Isaac Pennington, of Cambridge, and others.

Post-mortem appearances.—Congestion and serous effusion in membranes and substance of the brain and spinal cord. Blood has also been found extravasated round the cervical portion of the latter. The fauces, root of the tongue, œsophagus, trachea, and bronchi, are highly vascular, and the lungs congested. Hydrocyanic acid has been found in the blood. The morbid anatomy of this disease throws little light on its nature, treatment, or pathology.

Treatment.—It is uncertain if any known medicine exerts the least influence over this disease. Pages might be filled with an account of the remedies which have been resorted to. Amongst other extraordinary recipes, the blood of the spoon-bill duck was lauded by Dr. Mayer, of St. Petersburgh, so lately as 1828. Salt and water to wash the wound with, and internally, was formerly much praised, and urgently recommended in an old work, entitled 'Strictures on the Present Practice of Physic,' A.D. 1758. Jean Baptiste Chomel admitted no less than eighty-eight plants as specifics against hydrophobia! Would we had one now!

Brangmarten, a German surgeon, says, "Before the dread of water sets in, the cure is not only practicable, but not unfrequent;" and Avicenna also, "Cura propinqua est, ante terrorem aquæ." Notwithstanding this, however, the established practice of the present day attempts little more than the alleviation of the sufferings of the patient by Opium, Indian hemp, Chloroform, and other sedatives or narcotics. Ice has also been found of great utility; and cases are related by Dr. Todd,* by Dr. Garrod,† and others, where this

* 'Lancet,' January, 1842.

† Ibid., June, 1859.

substance was taken without inducing the dreaded spasm.

A well-marked case of hydrophobia was latterly successfully treated at this sanitarium (Mount Aboo), in a somewhat novel manner, namely, by alternate cold affusion and the inhalation of Chloroform. A detailed statement of the case was forwarded to the Bombay Med. and Phys. Society, and is reported in the last volume of the 'Transactions,' 1860-61. In consequence of the repeated failure of all remedies, I considered I was justified in adopting this treatment, the *rationale* of which is as follows:—It is well known that cold affusion reduces the temperature, lowers the circulation, soothes the nervous system, and disposes to sleep; also that, applied to the head, it is one of the most powerful remedies in congestion or inflammation of the brain: it also blunts sensibility, and subdues pain. In cases of violent nervous excitement, what remedy so effective as a sedative? What so powerful to allay irritability? What lowers the pulse so soon, or aids more in inducing sleep?—thus fulfilling the indication in the treatment of hydrophobia, "to diminish excitability of the nervous system." When the circulation had thus been moderated, and the spasms which were *at first* rendered more intense *overcome*, I proceeded to administer chloroform; and the brain being relieved from congestion, the latter agent induced its anæsthetic results, without the phenomena of convulsive movements. Had I given chloroform previous to using the cold affusion, I fancy it would have added to the excitement which must have been present in the brain and spinal cord. I consider, to use plain terms, that the cold affusion paved the way for the employment of chloroform.

To relieve the throat, I also vesicated it externally with lunar caustic, and, moreover, applied the same agent to the whole length of the spine. The cold affusion and the chloroform were used at intervals of two or three hours, four or five times.

As the principal characteristic of the disease is spasmodic closure of the glottis, Mayo and Marshall Hall suggested bronchotomy; and the operation has been successfully resorted to by Dr. Scriven.*

Treatment of the bite of a rabid animal.—There is reason to suppose the virus remains dormant near the wound, and only becomes absorbed at the period of recandescence. At all events, the poison of a rabid animal does not produce its effects with anything approaching the rapidity of the serpent's venom. Hence the greater amount of benefit which may be expected from excising the bitten portion, as recommended from the time of Galen downwards. This should be effected as soon as possible after the injury is inflicted; but, if then neglected, the cicatrix should be removed. If the injury is in such a position as to forbid the application of the knife to the whole extent of the wound, the parts should be well scarified, and free bleeding encouraged by suction, either with the mouth or cupping-glasses. A late writer in the 'Lancet' recommends gunpowder should be well rubbed in after scarification; but as this leaves an ugly black mark ever afterwards, and the application of Nitrate of Silver is equally efficacious, the latter agent should be preferred. Nitric Acids and other escharotics have also been recommended; but, individually, I have more reliance in the efficacy of free bleeding to carry away any lodged virus, than in its destruction by escharotic agents afterwards.

CHAPTER III.

SNAKE-BITE.

There are in this country numerous varieties of snakes. In the province of Scinde, in 1855, it is

* 'Ind. Lancet,' December, 1860.

reported that 300 persons perished from injuries inflicted by these reptiles. In about three months 10,000 snakes were killed in the same province, Government having offered a reward of four annas a head.* In the Kurrachee collectorate alone, in the month of July, 1860, rewards were paid for the destruction of 909.† In Dr. Russell's great work, 'On the Serpents of India,' forty-three different varieties are delineated, of which, however, only seven were found to possess poison-fangs. Of forty varieties in the Concan and Deccan, not more than six or eight are poisonous. Indeed, it would appear that the number of venomous snakes is considerably less than generally supposed. Professor Gmelin, in the 'Systema Naturæ,' gives a list of 219 species, and Linnæus states one in ten only are dangerous. It would appear, however, that many snakes possessing venomous fangs are not mortal to man, though they may be destructive to smaller animals.

Symptoms.—Pain, redness, and swelling of the part bitten; faintness, sickness, and vomiting. The breath becomes short and laboured; the pulse low, quick, and intermittent. The wound becomes black, livid, and gangrenous; the skin of the wounded limb, and sometimes of the whole body, assumes a yellowish hue; the glands of the axilla or groin, according to the extremities wounded, inflame and suppurate (a result said to follow the bite of the Phoorsa snake—very prevalent in the Bombay Presidency—more frequently than the bites of any other species). Cold sweats and convulsions come on; and the patient, after becoming comatose, sinks sometimes in a few hours, but more commonly at the end of three or four days. The depressing effects of fear will in all cases assist the operation of the poison; and the symptoms are more or less intense, according to the amount of venom inserted in the wound. This will probably

* Kurrachee Paper, 'Our Paper,' July 27, 1860.
† 'Scinde Official Digests,' 1860.

be less if the serpent has shortly before bitten some other object, or if the injury is inflicted through some portion of the clothes. It has also long since been observed, as the passage in Virgil, 'Georg.,' lib. iii, commencing "Postquam exhausta," shows, that the same serpent possesses very different degrees of power at various seasons of the year.

From cases brought forward by Dr. Russell, by Pennant, and other writers, it would appear that snake venom occasionally induces universal torpor and lethargy, without pain, and in this manner causes death. Thus, the asp is said to kill in this way; and we are told Cleopatra preferred this painless death to any other. The Behun snake of Nepal is also said to induce like results; and hence has arisen the belief of the country people that the reptile goes abroad during the night, and, finding people asleep, inhales the breath of its victim until life becomes extinct, the small bite, perhaps, remaining undetected.

This immediate lethargy from snake-bites is certainly exceedingly uncommon; but inasmuch as instances of the kind have been reported, it is well to bear the possibility in mind. If the torpor mentioned by Russell and Gowdie is, as I suspect, a condition of coma immediately occurring, we have an exaggerated and quickened result—probably the effect of a plentiful introduction of powerful venom through a minute opening into a debilitated system.

Post-mortem appearances.—Infiltration of lymph and serum in the tissues around the bitten part, which has also been found hardened. There are no morbid appearances pathognomic of snake bite. Congestions have been found in internal organs, but it is questionable if these appearances depend on the venom of the snake. How the latter induces its poisonous effects upon the blood is, like the action of cholera poison, complete mystery.

Treatment.—It would be an endless task to enumerate all the remedies which have been imposed on the credulity of mankind as specifics. The ancient

physicians extolled preparations of the serpent itself. Seneca and Pliny inform us, human saliva was believed to be a powerful remedy. A great variety of vegetables have been celebrated, the chief of which is "chandraca," so called by Sir W. Jones. It has, however, been described under different names, as "ramental naghawulli" and "ophirrhiza mungos."

Mr. Underwood states, a decoction of the leaves near the root of the common male fern (*Polypodium filix mas*) is used as a secret remedy in Australia.

The oxides of metals have also been recommended, under the idea, originating with the late Mr. Boag (Bengal Service), that the "poison of serpents acts upon the blood by attracting the oxygen upon which the vitality of that fluid depends;" but their use has not been followed by any decided success.

Fontana, the Italian naturalist, conceived he had found a specific in the Nitrate of Silver; and certainly his detailed experiments tend to show that a mixture of caustic and venom destroys the power of the latter. It does not, however, follow that the same would be effected by the application of caustic to a bitten part. It is not probable that the caustic would reach the whole of the virus inserted in the wound; and as its corroding action stays the flow of blood, it appears quite as likely to do harm as good. The same remark applies to the use of the actual cautery.

The best treatment has thus been shortly expressed by the editor of the 'Mirror,' in his report of the case of cobra bite, occurring in the Zoological Gardens in 1852:—"Scarifications, suction of the wound, if possible a tight ligature, combined with every means to combat torpor, ought to form the basis of treatment."

Recently, by order of the Bombay government, rules of treatment recommended by Drs. Beatty and Wylie, both of the Bombay Service, have been published in the native languages. The former gentleman advises immediate application of a ligature above the

bitten part; scarifications with a razor, knife, or any sharp instrument procurable; the induction of free bleeding by suction with the mouth or otherwise; and the exhibition of stimulants most readily procurable.

The latter officer gives 30 or 40 drops of Liquor Ammoniæ every ten or fifteen minutes, till the symptoms of the poison disappear. To those of less than fifteen years old, 20 drops only should be given; and to infants, from 3 to 10. The greatest care is to be taken to mix the Ammonia with a sufficient quantity of water, to enable it to be swallowed without pain.

The Inspector-General, Dr. Rooke, in forwarding these recommendations to government, wisely associated the two methods of treatment, *the combination forming the most successful practice known.* Since the above was published, last year, 1860, cures have been reported by L. Tucker, Esq., magistrate of Rutnagherry, and by Mr. Campbell, chief of the police of the same place, who also applies the Ammonia to the wound.

The stimulating treatment is not, however, by any means a novel conception, and has been mentioned by many authors, both medical and lay; by Dr. Russell, Dr. Boag, Malte Brun, Pennant, and Forbes, the latter of whom, in his 'Orient. Mem.,' vol. i, p. 45, states, "The outward application of Eau de Luce, and a quantity of warm Madeira taken inwardly, are generally effectual in curing the bite of the most venomous snake."

CHAPTER IV.

INJURIES FROM SCORPIONS AND CENTIPEDES.

In all parts of India these pests are very numerous, and may often be found in numbers amongst old carpets or rubbish of any kind. The part injured

generally swells, smarts, and aches considerably, and frequently the absorbents running from the wound are somewhat reddened. The best application is stated to be a poultice of Pulvis Ipecac., but a rag moistened with vinegar affords much ease and relief. Bathing the part with salt and water is also very effectual.

Mosquito-bites.—A mosquito-bite usually rises into a small, white, hard lump, which on further provocation proceeds to suppurate, frequently degenerating into a very obstinate sore, and particularly so if the individual be either very plethoric, scorbutic, or cachectic. The best application is vinegar and water, but any ulcer which may afterwards form must be treated on established surgical principles.

CHAPTER V.

TYPHOID FEVER.

It was formerly a prevalent idea that typhus and typhoid fever were not seen in the tropics. That the former, in its true form, is ever met with in India there is no good recorded evidence; but the latter has been noticed in abundant instances. Thus, Dr. Goodeve published a clinical lecture on typhoid fever as it occurred at the Medical College Hospital, Calcutta. Cases also of this fever in India, in which the characteristic lesions of Peyer's patches were detected after death, have been recorded by Drs. Scriven and Ewart, of the Bengal Service. Morehead also, who, in the first edition of his 'Clinical Researches,' stated that the typhoid, typhus, and relapsing fevers of Dr. Jenner were unknown in India, in the second edition of the same publication, admits the occasional existence of the first disease.

Typhoid fever, therefore, must without doubt be regarded as one of the endemic diseases of India, and is characterised, as in Europe, by the dry, brown, retracted tongue, dorsal decubitus, low muttering delirium, contracted pupils, sordes, abdominal tenderness, and rose-coloured petechial spots.

This typhoid state, as already pointed out, is a frequent termination of remittent fever, and also, when it is specially developed as a result of its own peculiar poison, it very frequently assumes a remittent form. Thus, malaria modifies this disease, as it does most others in India. The scorbutic taint is a strong predisposing cause.

TREATMENT.—The adynamic character of the symptoms will always demand stimulants, and prostration must be combated by good animal broths, the utmost watchfulness being maintained for local diseased manifestations. Bearing in mind the malarious complication certainly existing, Quinine should be administered in moderately large quantities, as recommended for the disease in temperate climates by Dr. Voght.

CHAPTER VI.

PESTIS; PLAGUE; MAHAMURREE.

THESE diseases may be defined as very malignant contagious fevers, depending on a specific poison, and attended with an eruption of glandular tumours, large boils, or abscesses. Epidemics of this description ravaged the Himmalehs, from the snowy range downwards, from 1834 to 1853, and were reported on by several medical officers.* The same character of

* MacAdam, 'Trans. Bom. Med. Phy. Soc.,' vol. i; Forbes, ibid., vol. ii; Francis and Pearson, 'Ind. An. Med. Sci. Ass.,' 1854; Steven, 'Ind. An. Med. Sci.,' Oct., 1854.

disease has been described under the name of Pali Plague, and prevailed in 1855 in the northern districts of Guzerat, and was reported existent in the western extremity of Kutch in 1860.

Most observers regard this as essentially the same disease which formerly ravaged Marseilles, Moscow, and London, which has been described by Russell* as it appeared at Aleppo, which is treated of in Sir J. McGrigor's 'Medical Sketches,' and which at the present period breaks out in Alexandria, Cairo, Damascus, and Constantinople every few years.

Symptoms.—The disease generally commences with febrile excitement of a remittent character, which is quickly succeeded by darting pain in the inguinal or axillary glands. This inflammatory action generally passes on to suppuration, and dusky yellow pus is discharged. At other times vesicles form on different parts of the body, which may or may not be succeeded by large carbuncular formations. Petechiæ and hæmorrhages from mucous surfaces are also common. The commencement of the affection is marked by great depression, from which the patient never rallies, but dies before suppuration is established. At other times reaction takes place, and the sufferer, lingering for ten or twelve days, dies with typhoid manifestations. It is stated that on the third or fourth day profuse perspirations appear, which are to be regarded as favorable signs. These are, therefore, critical days.

Post-mortem appearances. — Congestions and softening of the liver and spleen; red patches in the intestines; congestions in the lungs.

The question of contagion has been much discussed, and arguments are not wanting against the theory. As the usual locality of plague is that where sanitary measures have been entirely neglected, it is probable that a vitiated and impure atmosphere is the origin of the malady. If this be the case, we can scarcely expect the greatest amount of benefit from the strict

* Russell, 'History of the Plague at Aleppo.'

quarantine system. This, however, is certain, that predisposition to the disease is engendered by any of those causes so frequently named, which depress the nervous energies; and that, whether it be communicated by contact or not, those are most liable to be attacked who enter infested localities.

TREATMENT.—Most authorities agree that the treatment should be eminently stimulating, and that all means of improving the *vis vitæ* should be employed. When the abscesses form, and suppuration is apparent, they may be opened. Depletion and Mercury have been recommended; and the latter, carried to salivation, has appeared to be beneficial.

CHAPTER VII.

SYPHILIS AND GONORRHŒA.

IT is not my intention to enter on a description of these diseases, as in their essential characteristics they present little difference to the varieties met with in other parts of the world. There is, however, an additional gravity attached to these disorders when they occur in the eastern tropics, inasmuch as they are, perhaps, the most powerful predisposing causes of endemic disease which can exist in the system of the European. Not only is syphilis *per se* so influential in the induction of debility and cachexia, but also its specific remedy, Mercury, although administered with the greatest caution, will certainly tend, to a considerable extent, to prepare the system for the reception and development of malarious and endemic agencies. It is scarcely necessary to direct attention to that well-known condition designated the syphilitic cachexia. Every one who has seen much hospital practice, par-

ticularly in a large manufacturing town, can have no difficulty in recalling to mind "the haggard shanks, shrunk eyes, and bony face," the pallid countenance, the peculiar gait, and the sallow colour, and loose appearance of integument characterising these melancholy cases. If this condition is developed at home in a bracing and invigorating climate, it cannot be a matter of surprise that the heat, malaria, scorbutic taint, and consequent enervation and debility, inseparable from tropical residence, will render syphilitic cachexia more easily inducible. Thus, the cachexia from the climate and the cachexia from the disease both combine, and react in reducing the unhappy patient to that condition of debility which renders him unable to withstand the slightest attack of abdominal disease, dysentery or diarrhœa, which not unfrequently closes his earthly career.

Although, of course, gonorrhœa does not exert the manifest influence towards the induction of debility and cachexia which the constitutional effect of syphilis exerts, still persistent urethral discharge is to be regarded as a powerful predisposing cause of disease. Gonorrhœa having been contracted by individuals, particularly if of scrofulous constitution, a constant more or less gleety discharge frequently persists for years. This is aggravated by every slight attack of fever or other endemic disease, and in its turn again aids climatorial influences in their operation.

Treatment.—Without entering into a discussion of the arguments for and against the mercurial treatment of primary or secondary symptoms, I may briefly state that I believe the poison of syphilis to be almost as varied in its intensity as the characters of the sore and following results are known to be. Also that virus from the same person differs in virulence at various periods, and that virus possessing the strongest powers will induce varied sores and after-symptoms on different constitutions. Thus, I have known the non-indurated or pustulous chancre (little more than excoriation) and the Hunterian or indurated

chancre arise from the same exposure ; the latter being the more certain result according as the surface is more sensitive, either from constitutional causes where the ulcer is developed on the integument, or from the prepuce generally covering the glans when the sore occurs on the latter. Furthermore, I believe the mercurial influence is not necessary for the cure of the mildest form of syphilis, either primary or secondary ; and, therefore, remembering the urgent necessity of avoiding as much as possible the exhibition of all mercurials, especially in Indian practice, I consider the mineral is contra-indicated in all primary chancres of the non-indurated or simple character. I do not, however, maintain that Mercury will not cure this sore ; but I submit that the disease will eventually wear itself out and pass away, even although it does so in the shape of mild cutaneous eruptions, sore throat, &c., and this with far less injury to the constitution than if sooner despatched by the influence of Mercury.

When, however, a Hunterian or clearly indurated chancre exists, Mercury is "a remedy of necessity ;" but it must be administered with caution, and only in sufficient quantity to neutralize the syphilitic poison, otherwise mercurial cachexia will combine with the disease, and render the latter state of the patient worse than the first.

With regard to the treatment of secondary symptoms, I hold that the exhibition of Mercury internally is uncalled for, and, indeed, mischievous as a method of cure ; and especially is this the case in India. Happily, however, there is another method of effecting all the good which is capable of resulting from Mercury. This is the mercurial vapour-bath, as so extensively and successfully employed by my friend, Mr. Langston Parker. Having had the charge of this gentleman's syphilitic cases for a term of more than three years during my resident surgeoncy at the Queen's Hospital, having paid considerable attention to syphilitic diseases in that institution, where a wide field

for the study of the affection exists, and having used the vapour-baths in the East, I may be permitted to state the result of my experience, which is, that for secondary symptoms of syphilis occurring in India, of whatever variety, there is no remedy so efficient, and less costly to the constitution, as the mercurial vapour-bath has proved to be.

Neither is the apparatus required of a costly character; a cane-bottomed chair, a blanket, a pan for the mercurial spirit-lamp, and boiling water, being all the essential requisites. The baths may be given every two, three, or four days; diluent drinks are to be administered at the same time, to promote diaphoresis; and during the intervals preparations of Iodine may be employed.

Respecting the treatment of chronic and confirmed gleet I have little to advance. Local applications sometimes prove beneficial; but as strong injections are liable to act as excitant causes of stricture, their employment, excepting in a very diluted form, is not to be recommended. Although it may be looked upon as an opprobrium to the profession that we possess no royal road leading to the cure of chronic gleet, it is, nevertheless, a well-known fact. Chronic urethral discharge, if not the primary symptom of that degree of chronic inflammation and thickening which eventually slowly, but surely, leads to stricture, depends on the general health more than on any specific cause, such as the preceding gonorrhœa arose from, and, therefore, is only to be relieved by measures directed towards the improvement of the constitutional powers.

Section VI.—Diseases depending on Defective Diet as a chief cause.

CHAPTER I.

SCURVY.

Formerly scurvy was considered inseparable from a life at sea, and until late years the disease carried off from one sixth to one tenth of a ship's company during most long voyages, or even committed worse depredations. Thus in the "Centurion," the ship in which Lord Anson made his memorable voyage round the world, in the latitude of the Island of Juan Fernandez, forty-three men died in one month, and double that number during the next, while others were reduced to mere "haggard spectres." Again seventy-six years ago, in 1779, the mortality was at the rate of 125 per thousand annually of the whole naval force; fifty years ago, 31; and now the lifetime of sailors in a well-regulated ship at sea is nearly equal with that of those living in favoured regions ashore.*

The most recent melancholy instances of the ravages of scurvy, viz., the sufferings of Hobson, and death of Blacknell, are to be found in the narrative of Sir L. McClintock's late expedition.

The scorbutic diathesis may be said to be a very prevalent condition in India, and confirmed scurvy an affection which the Indian surgeon may at times be called upon to treat occasionally in regimental hospitals; more frequently if his duties are either in one of the presidency hospitals, or on board the vessels of

* Johnstone, "Geograp. Dist. of Health and Disease," 'Trans. Epidem. Soc.,' May 5, 1856.

the Indian navy; not, however, because the seamen of that service suffer much from the disease, for, on the contrary, they are nearly exempt; but during the medical officer's cruises about the Persian Gulf, Red Sea, and other waters, he will scarcely fail to be requested to visit persons affected with scurvy, in one or other of the merchant vessels he may chance to meet. The same class gain admission into the hospitals of the presidency.

Causes.—Scurvy was formerly supposed to depend entirely on the use of salted provisions; but recent reported experience of the 75th Regiment in Caffirland, of the English troops in the Crimea, and other instances, would lead to the belief that all insufficient, exclusive, or artificial diet, if long persevered in, will induce symptoms of the disease, and particularly if the defects of food involve a loss of the just proportion of succulent vegetables, with their salts of potash and azotized material. Thus it is the absence of certain constituents of food, instead of the presence of noxious material, from which scurvy arises. The debilitating effects of elevated temperature, malaria, extreme cold, night damp, impure atmosphere, insufficient shelter, depressing passions, fatigue, previous attacks of illness, and continued absence of solar light, are powerful predisposing causes.

Symptoms.—Weariness; dejection of spirits; dull pain in the limbs; palpitation and shortness of breath; countenance sallow and bloated; pulse small and frequent; tongue pale and tremulous; sleeplessness at night; gums swollen, spongy, and sometimes livid, and bleeding on the slightest touch; teeth loose; breath fœtid; petechiæ on various parts of the body. Slight pressure as of one limb on the other, particularly on the inner surfaces, produces a bruise. Scratches become foul ulcers; old cicatrices open afresh, and previously fractured bones again become disunited. The joints become swollen and stiff from fibrinous exudations, and the muscles rigid and painful. Great emaciation ensues, and passive hæmorrhages take place from

nose, ears, bowels, lungs, or bladder. The bowels are sometimes constipated, but more frequently there is diarrhœa or dysentery; the urine is high-coloured and acid, and, together with the evacuations, intolerably fœtid. The patient is also subject to sudden faintings, and sometimes expires suddenly on the slightest exertion. The intellect remains clear.

The blood in this disease is found to be deficient in red corpuscles, and superabounding in fibrine. The former, under the microscope, present a shrivelled appearance, and have been found reduced to forty-eight parts in one thousand, and the latter increased to three times its normal quantity. It also does not coagulate readily, and putrefies soon.

The terms purpura simplex and purpura hæmorrhagica have been applied to the different stages or varieties of the affection; but as purpura occurs in individuals who have not undergone deficiency of any necessary food, and without any other symptoms of scurvy, the term should only be applied in connection with the latter disease, to represent one of the frequent results.

Post-mortem appearances.—The usual termination of scurvy is by diarrhœal and dysenteric affections; and the post-mortem appearances are those of such diseases, with frequent enlargement of both spleen and liver, and emaciation of all muscular structure.

As Dr. Watson observes, this is "eminently a blood disease," which fluid is denied some essential ingredient, most probably Potass. How the results arise is unknown; but that it is a disease *per se*, and not "primary pathology" (as Dr. Knapp, of Iowa, would have us believe) "of every disease," is indisputable. It is, however, a powerful predisposing cause of many diseases.

Treatment.—Dr. Murray, Dr. Harty, and others, have thought some cases, at the onset, were benefited by antiphlogistic measures, as bleeding and saline purgatives; but modern experience condemns this treatment, and shows the use of fresh meat and

vegetables to be at once the great preventive and antagonistic of scurvy, and where these are deficient, lemon juice, as recommended two hundred years back by Woodhall, or, otherwise potash, which Dr. Henderson obtained from gunpowder, or, as Dr. Garrod has more latterly suggested, from that ubiquitous weed, tobacco. As adjuvants, fruits, sugar, and molasses, cocoa, pickles, vinegar, onions, nopal, all the Cruciferæ, and potatoes will be most beneficial. Dr. Garrod has shown it to be very probable that the vegetables named as possessing a reputation as remedies for scurvy owe their good effects to the potash they contain. Hence the value of cresses and uncooked vegetables, as potatoes, much of the salts being dissolved out in the process of boiling.

When anæmia is marked, the recumbent posture must be maintained. If there be great prostration of strength, wine and fermented liquors, as ale, beer, cider, or a fresh infusion of malt, should be given. If aperients are required, infusion of Tamarinds, Cream of Tartar, or Sulphate of Soda, may be used. Ulceration of the gums requires astringent gargles of Alum, Muriatic Acid, decoction of Bark, Port Wine, or Vinegar. Acute pains may be relieved by Opium; and difficulty of breathing, by diffusible stimulants, as Æther, with Camphor and Ammonia.

Prophylactic measures consist in the due admixture of vegetable food with the dict; and in cases where this cannot be obtained, the use of lemon juice or Citric Acid; or this failing, Potash. On board ship the enforcement of cleanliness and ventilation is eminently necessary; and as moist atmosphere is undoubtedly injurious, dry rubbing should be substituted at certain periods for the now too frequent washings practised on board, which I am glad to find is condemned by Dr. Armstrong, in his 'Naval Hygiène.'

Scorbutic Ulcer.—It has already been stated that trivial injuries in those affected with scurvy frequently determine with foul and ill-conditioned ulcers, having a strong tendency to phagedænic

sloughing. These, sometimes opening arteries, render amputation necessary, or produce so great injury of muscles and tendons that permanent contractions and distortions are the result. These ulcers have prevailed to a great extent amongst troops, both European and native, employed in Prome, Rangoon, and Ceylon; and Mr. Ward formerly described an acute and chronic form. They are always attended with great debility, impaired appetite, white, dry, and loaded tongue, total sleeplessness, quick pulse, and other marks of constitutional irritation; while there will generally be spongy gums, loose teeth, maculæ, or other symptoms of the scurvy diathesis. The treatment consists in the employment of antiscorbutic remedies internally; and the application of dilute Nitric Acid, charcoal poultices, the balsams, Tincture of Myrrh, decoction of cloves or nutmeg leaves, as recommended by Mr. Geddes, or, if these cannot be borne, emollient cataplasms.

Scorbutic nodes are also common, and for these the Iodine paint or tincture, applied externally, is the best local remedy.

The Aden ulcer, Delhi boil, Bagdad boil, Scinde boil, Gwalior boil, and other localized affections of this nature, are most probably of scorbutic origin.

Section VII.—On the Entozoa commonly met with in India.

CHAPTER I.

DRACUNCULUS.

Dracunculus is essentially a tropical disease, but is not confined to India, having been noticed pre-

valent in Egypt, Arabia, Abyssinia, and Guinea. According to Rudolphi's nomenclature, it is also called hair worm (Filaria Medinensis,) but this latter name does not convey a good idea of the animal, as it is much thicker than hair, appearing like a thin piece of cat-gut, one-eighth or one-sixth of an inch broad, slightly elastic, white, and semi-transparent. In some stages of its growth the end, for a few inches, is quite as thin as hair, but becomes suddenly thicker. Cuvier states the worm acquires the length of ten feet or more; but the average length of twenty specimens preserved by Dr. Grierson, (Bombay army), was 23⅝ inches. Greenhow states it may be one foot eleven inches long. Its interior, according to Dr. Carter,* is occupied by an ovisac filled with myriads of minute young. The same gentleman discovered that minute worms, having great resemblance to the young of the Guinea worm, existed in abundance in some of the ponds near Bombay, and supposed these animals might penetrate the integument *viâ* the odoriferous channels, and so grow into Guinea worms. An objection to this theory is, that between these worms and the young of the Guinea worm there is an evident difference in size. Another is the assertion, that the young of the dracunculus die when placed in water: but Messrs. Duncan and Forbes found they survived about six days; and the latter author, moreover, states that, when placed in moist clay, they survived twenty days. This gentleman also found very similar descriptions of animalculæ in the tanks about Dharwar, and when the changes which take place in the lower animals from external circumstances are taken into consideration, it seems at least probable (although, indeed, Mr. Greenhow,† Bengal service, has not been able to find these worms in some localities where dracunculus prevailed), that the animal-

* Carter, "Notes on Dracuneulus," 'Trans. Bomb. Med. Phy. Soc.,' 1853-54.

† Greenhow, 'Ind. An. Med. Science,' vol. vi.

culæ noticed by Dr. Carter and Mr. Forbes may be the Guinea worms in their first state.

This probability being granted, the question presents, how do they effect an entrance into the human body? and from a consideration of the facts known about these and other entozoa, I am disposed to believe that the Guinea worm enters the system *both* by the mouth and through the external integuments. If the first is not admitted as possible, it can scarcely be explained how the worm makes an occasional appearance in such positions as the socket of the eye; or between the heart and pericardium;* or in the cavity of the abdomen;† but if we admit that the minute *ovum* may be taken into the circulation, there is no difficulty. If it be objected that the ovum cannot pass through the system of lymphatics leading to the general circulation on account of the small calibre of the former, I would direct attention to the minute size of some animalculæ, for instance the infusoria, concerning which Professor Owen‡ states, the *Monas crepusculus* have been estimated at the $\frac{1}{2000}$th of a line in diameter; of such infusoria a single drop of water may contain five-hundred millions; a number equalling that of the whole human species now existing on the surface of the earth!" That the process of digestion will not suffice to destroy existence, is sufficiently clear from the fact of the gadfly-egg attaining maturity attached to the splenic extremity of the horse's stomach; from instances of leeches, caterpillars, and larvæ of flies, having been discharged alive;§ from the fact of a whole family having become affected with ascarides from using the water of a well in which minute worms resembling the latter were subsequently found, and losing the disease when they discontinued drinking the water;‖ and from the circumstance that the

* Morehead, 'Clinical Researches,' vol. ii, p. 715.
† 'Calcutta Transactions,' vol. i, p. 154.
‡ Owen's 'Lecture on Comp. Anat. and Phy. of Invertebra.'
§ Elliotson's 'Practice of Physic,' art., "Vermes."
‖ 'Dublin Transactions,' vol. ii.

Guinea worm may often be felt deeply underneath the skin by the patient, long before it can be traced by the finger.*

To the conclusion that the worm also makes its way through the surface, I am led by the fact that its usual position is in the foot or ankle, which parts are mostly exposed, and from observing that sailors employed on water parties, and who have gone bare-footed about sodden ground around wells, or shooting water-fowl, have suffered afterwards from dracunculus. Dr. Scott, late of Bombay, while asserting the external origin of Guinea worm, states, the men employed as water-carriers (bheesties) are often infested with the plague, but I cannot adduce this as an argument, not having observed these men to be more subject to the worm than others. Neither can the usual locality of the animal be brought forward as a very forcible argument, it having been known to change its position while embedded in the cellular tissue.†

Period of Incubation.—This is very variable, I have known the worm developed within five weeks of the arrival of the individual in Bombay. Instances have occurred of persons leaving India, and only noticing the worm after a four months' voyage round the Cape. Dampier, the navigator, had one developed half-a-year after he left the East. The period of latency is probably commensurate with that of growth, quicker in some cases, slower in others. It probably lies between one and twelve months.

Guinea worm is generally solitary, but numbers may exist at one time in the same individual. Clot Bey records an instance where twenty-eight appeared in the same person. Carter mentions a case where twenty-seven issued from the right leg, and sixteen from the left extremity. Minas gives an account of a patient who died, in whom "the whole skin was a network of Guinea worms."

* Stewart, 'Ind. An. Med. Sci.,' vol. ix.

† Ewart, "On Statistics of the Bheel Corps," 'Ind. An. Med. Sci.,' July, 1859.

It is said there are both male and female worms, the latter being twice the longer.

Symptoms.—It is most prevalent between the ages of 20 and 45, but it occurs at all periods and in both sexes. Its most usual position has already been stated, but it is also seen in other parts, as the abdomen, back, scrotum, penis. Attention is in many instances first drawn to its presence by a corded substance being felt beneath the skin, having much the feel of a small tense rolling vein. Sometimes a sensation as of the worm moving (even from the foot to popliteal space) is noticed. The entozoon generally lies just beneath the true skin, embedded in the cellular tissue, but it often penetrates between the muscles, and in some instances is coiled round them or their tendons. As the worm approaches nearer the surface, a small blister forms, and indeed this bullæ oftentimes attracts the first notice. Dr. Scott states, if this blister be rubbed and broken, it frequently happens that the most insufferable itching is produced. This I have heard made the subject of complaint before the vesicle burst. Under the raised cuticle is a thick white mucus, in which the head of the worm may sometimes be found, thin and fragile as the finest hair. In the majority of instances, however, and particularly if the vesicle is opened artificially, it is extremely difficult, often impossible, to seize the end of the worm. If the whole of the white glairy fluid is removed, a slightly conical shaped hole remains, in the centre of which are several white spots, through one of which the animal issues; but when removing the inflammatory exudation, the worm may be broken off level with the surface, and then cannot readily be detected.

The affection is most prevalent in India during the rains, or immediately before or after that period, in the months of May and September.

Treatment.—It has been the practice to make an incision over the worm, to pass a probe underneath and gradually extract it, but this method is open to several objections. It appears probable that the ani-

mal is only sufficiently loose for extraction, when its head appears at the surface. This seems to be the natural mode of exit, which it is the province of the surgeon to assist. If the worm be situated altogether in a fleshy part the operation may succeed, but if the reverse, inflammation and suppuration will probably be excited by the endeavour to extract, while the animal is not sufficiently loosened or matured. The operation has, however, been latterly advocated by Dr. Stewart.*

Sometimes the approach of the head of the worm to the surface, causes an amount of inflammation requiring fomentations and poultices, till suppuration takes place. When this latter occurs, or when the bullæ before mentioned forms, and appears on the point of bursting it may be opened, and the head of the worm sought for, seized with forceps and pulled gently and gradually until there is a little resistance. When as much of the animal as the resistance will allow, has been drawn out, the end should be secured and wrapped round a piece of quill or bougie, and retained near the wound with a little adhesive plaster. Extraction is only to be attempted once in the twenty-four hours, and sometimes a foot, at others not an inch will be gained. Its exit is much facilitated by friction with oil, and pressure over the line of the worm. The utmost care must be taken to avoid breaking the animal, as in that case it probably dies, and the minute young passing from the ovisac into the cellular tissue, fever, tumour, and tedious suppuration are the consequences. This inflammation is sometimes followed by irritative fever, considerable sloughing, and even gangrene, from which death has been known to result. Thus, Dr. Leith's mortuary returns for Bombay during eight years, from 1848—57 record 133 deaths from dracunculus and its subsequent effects.

A piece of oiled silk should be laid over the wound to prevent moist applications coming in contact with

* 'Ind. An. Med. Science,' No. 9.

its texture, as they soften the structure and lead to rupture, and, unless there be pain and swelling, it is better to avoid the use of such agents altogether. If it breaks, the local disturbance is greatly subdued by the application of nitrate of silver to the surface.

The natives use many remedies, among which poultices of the leaves of the Melia azadirichta are supposed to possess great efficacy.* The Madar leaf (*Asclepias gigantea*), Tobacco, Datura, Ghee, and the "singhy" or native cupping, are also used.† The cupping glass is also recommended by Dr. Carter.‡

Assafœtida and other drugs have been supposed to possess a prophylactic power, when used internally or externally, oiling the limbs is sometimes resorted to as a preventive, but cleanliness, and the use of soap with water, are the best means of preventing its entrance through the integument ; and the habitual use of boiled and filtered water, of avoiding taking the ovum internally.

CHAPTER II.

TAPE-WORM.

This worm is not unfrequently the cause of much discomfort to the Anglo-Indian, neither are the natives by any means exempt from one or other of the varieties of vermes. The form most usually met with among the flesh-eating Europeans, and Mussulmen, is the tænia solium—the tænia osculis marginabilis of Dr. Fletcher's nomenclature. The Hindoos who confine themselves mostly to vegetable diet are more infested with lumbrici. The length of these

* Greenhow, 'Ind. An. Med. Sci.,' April, 1856.
† Minas, 'Ind. An. Med. Sci.,' No. 4.
‡ 'Indian Lancet,' Dec. 1, 1860.

parasites is sometimes enormous, according to Vandoverer, 40 Dutch ells, and to Boerhave, 300 ells long!

The symptoms denoting the presence of tænia are the same in the east as in other parts of the world, consisting of colicky pains, variable appetite, fœtid breath, uneasy sleep, palpitation and irregular pulse, and occasionally slimy stools. It frequently occurs that these and like anomalous feelings are considered due to liver complaint, and, therefore, the possibility of tape-worm existing must always be recollected when obscure symptoms of the kind present.

The researches of Von Siebold of Munich, Kuchenmeister of Zittau, and Nelson of Birmingham, leave little reasonable doubt that cystoid worms are transferred to the alimentary canal, by being eaten as a cystic animal in uncooked or half-cooked flesh, and particularly in that of swine.

Treatment.—When resident in the vermifuge locality of Birmingham, and also when serving in the Persian Gulf, I had from time to time numbers of individuals suffering from tape-worm under treatment. Of Kossou, first introduced into practice by Dr. Vaughan (Bombay service), I cannot speak from experience in very favorable terms, as it failed in almost every case both in England and in the tropics to expel the head. The most efficacious mode of administering this remedy is to give half an ounce to an ounce of the drug in a pint of cold water, having previously allowed it to stand some hours. The whole should be swallowed, and followed in an hour's time by Castor Oil. Of the Rottlea Tinctoria, or Kamala, an euphorbiaceous plant growing in certain hilly districts in India, and recommended by Dr. M'Kinnon (Bengal service), I have had no experience. It is, however, said to be superior to Kossou, and is now being extensively tried in this country in the form of Alcoholic Tincture, and powdered root. The Ol. Filix Mas, formerly the basis of Madame Nouffer's famous remedy, I have often found very efficacious; and my friend Dr. Nelson describes it as an excellent

vermifuge. A good method of treatment is to give some preparations of Iron for a week or ten days, and afterwards a purgative dose of Castor Oil. The Iron appears to sicken the worm, and thus render it easy of expulsion. Oxide of Silver in three grain doses twice a day, also followed by Oil is sometimes successful. Pomegranate root and Bark has been used from the time of Celsus, and its power is not appreciated as it deserves. The old remedy of Maddens, viz., Turpentine Oil, is not by any means the least efficacious, although sufficiently unpleasant to take. I do not, however, recommend its use in this country, where abdominal determination and congestion is so readily excited.

Besides these named, India contains numerous indigenous plants which enjoy a greater or less repute as vermifuge remedies. Of these the seeds of the Butea Frondosa, or Palas, the seeds of the Cucurbita Pepo, or Khondha, and the oil from the pericarp of the Azadarichta Indica or Nimb, are the Anthelmintics chiefly celebrated as efficient in tape-worm. The last terms are the native names.

Section VIII.—Diseases depending on Climatorial Influences or Secondarily on one or other of the preceding Diseases.

CHAPTER I.

CONSTIPATION AND ACCUMULATION IN THE LARGE BOWELS.

Affection of the large bowels may arise from many causes. Perhaps most frequently it is co-existent

with, and caused by that debility and cachexia which has been prominently brought forward throughout this work. In other instances it appears to depend on mere loss of tone of the muscular coat of the bowels, leading as a natural consequence to distension and constipation. In other instances it is an early but somewhat obscure symptom of approaching ramollissement of the brain; and again, in other cases, the retained excretions and fæcal matter from pressure on large blood vessels give rise to anomalous sensations, which may be mistaken for cerebral disease. Often cicatrices and contractions arising from dysentery cause accumulations in the bowels, particularly if a natural want of tone is superadded as an exciting cause at a later period of life.

From whatever cause arising, constipation and accumulation in the large bowels occasion much the same symptoms, which are,—furred tongue, fœtid breath, sallow countenance, sometimes jaundice from mechanical pressure, stools scanty and alternating with diarrhœa, large and tumid abdomen, and considerable distress from flatulence. In some cases retained matter can be clearly traced beneath the integument; and this is particularly evident when the cæcum, or sigmoid flexure, are the seats of accumulation. Occasionally attacks of colicky pain occur, and less frequently inflammatory action is induced. Hæmorrhoids are very generally present. Constipation and accumulation in the large bowels occurs in the majority of instances in those who have been residers in India for some years.

Treatment.—In the absence of ascertainable disease elsewhere, as the exciting cause, the indications of treatment are, first, to remove the accumulations present; and, secondly, to prevent their again lodging. For the purpose of fulfilling the first requisite purgatives may be employed, as a combination of Calomel, or Blue Pill, and Aloes, with Soap; followed by compound Jalap powder, aperient mixture, or Castor Oil. Care must be taken to repeat the dose until all

tumidity of the bowels is relieved, and also until bright bile is discovered in the evacuations; by which it may be inferred that the whole intestinal tube is patent, and all retained material expelled.

As previously stated the class of individuals mostly coming under treatment for this intestinal torpor are old residents in India, whose constitutions are impaired, and who are more or less in a cachectic state. Large doses, therefore, must never be given, neither are remedies to be repeated daily. Every two or three days will be sufficient, especially if Castor Oil is taken on the morning after the purgative.

In many cases, however, particularly if hæmorrhoids co-exist, it will be proper to advise the use of the enema syringe, instead of having recourse to medicine. And if the treatment sketched above does not quickly —although perhaps temporarily—relieve, displacement or constriction of the bowels may be inferred. This of course will become more probable if the patient has at any previous period suffered from chronic dysentery. In such cases the contents of the bowel require to be softened, and therefore the use of warm laxative enemata is particularly appropriate.

The first indication of cure having been fulfilled, the second indication must be attended to. To prevent relodgment of fæcal matter, gentle tonics, combined with mild aperients, must be resorted to, or the operation of the bowels solicited by warm water enema. The habitual use of the latter is, in many cases, attended with much benefit, and may always be, with safety, recommended.

CHAPTER II.

HÆMORRHOIDS.

As above stated, piles are one of the consequences of habitual costiveness, and being themselves established, give rise to irritation of neighbouring organs, as the bladder, kidney, testicle, womb, or urethra; and eventually by repeated bleedings induce that lowered condition which renders the system so prone to malarious disease.

The accumulation of hardened fæces both irritates the lower bowels, and by its bulk and pressure mechanically prevents the return of blood from the hæmorrhoidal plexus. Moreover, the straining which the constipation induces causes the muscular fibres also to exert their pressure on the same veins; and when it is recollected that these vessels may be considered as the turning point of the blood, in its course from the hæmorrhoidal arteries to the veins of the same name, and that they consist essentially of a quantity of loops,* it can be easily understood how they become stretched, dilated, and varicose, and occasionally give way from the pressure of hardened fæces; from repeated action of the perhaps hypertrophied muscular coat; from the force of the abdominal muscles, or from obstructions in any part of the portal system.

In addition to these causes particular employments have an undoubted tendency to the production of the disease. Thus, continued and hard riding will sometimes be followed by an attack. Literary occupations, involving a sedentary life, not unfrequently lead to it. Employments requiring the maintainance of the erect posture will, by favoring the non-return of the portal system, also predispose; and this the

* Quain, 'On Diseases of the Rectum,' p. 32.

more readily, on account of the absence of valves in the veins connecting that system with the hæmorrhoidal plexus.

Warm, moist, and miasmatous climates, by inducing relaxation generally, and of the venous system in particular, are also causes. Congestion of the liver, another result of hot climates, is a fertile source; and to this must be added the frequent occurrence of diarrhœa and dysentery, either acute or chronic.

In India *all the exciting and predisposing causes* of hæmorrhoids are present, more so than in temperate climes, and we accordingly find the disease very often affecting the older European residents in this country.

Much neglect and apathy exists with regard to continued small losses of blood from piles, owing to a widely prevailing idea that such loss is beneficial and salutary. From the time of Hippocrates* and Galen to the present, the opinion has more or less obtained, that some morbid material was eliminated from the system, and more particularly from the liver. This notion, however, of peccant matter, black bile, or melancholic humours, is now no longer tenable, and the loss of blood, except in some rare instances, must be looked upon as decidedly injurious and pernicious.

These instances are where the discharge appears to act as a derivative, which is generally the case in indolent and plethoric persons habitually living too generously, or where the individual is threatened with symptoms of liver disease or apoplexy. Here, when moderate in quantity, it proves a source of relief; but when excessive or long continued, it gives rise to much debility, and induces that cachexia which the Indian practitioner so dreads.

The quantity of blood which escapes is sometimes enormous, and cases which appear hardly credible, have

* "In profluvio hæmorrhoideum velut quidam atrabil affine effluvit," 'Hippocrates de Mor. Vulg.,' p. 143.

been reported on undeniable authority. Thus, a Spanish nobleman is said to have voided every day, for four years, a pint of blood. Calvert mentions the case of a woman who lost three chamber pots full of blood in three hours, and Ashton gives as many as a dozen curious cases of this description, chiefly quoted from Hoffmann, Bozelli, and other Continental writers.

TREATMENT.—The treatment of external piles must be divided into that proper during the inflammatory stage, and that necessary when the part is quiescent. In the latter state the parts should be bathed frequently with cold water, or Solution of Alum, while tolerably active exercise should be taken, and accumulations having been removed, the bowels kept loose, with simple laxatives.

If inflamed, fomentations, poultices, leeches, and incisions, if matter form. If, afterwards, a relaxed and pendulous fold be present at the orifice of the gut, and if this growth becomes subject to repeated inflammatory attacks, it should be removed by curved scissors, care being taken not to take away more of the integument than covers the tumour, or, upon cicatrization of the wound, contraction of the anus is not unlikely to take place.

In the treatment of internal hæmorrhoids strict moderation in diet is a *sine quâ non;* stimulating drinks and food must be prohibited, and only that easy of digestion allowed. In some cases it is found a glass of spirits will induce an attack, and it is therefore imperative to abstain from using them. The bowels must be well regulated, without aloetic combinations; and all fæcal accumulations removed by emollient injections. The stools, moreover, should be habitually passed at night, instead of in the morning, that the piles, if protruded, may be returned, when the recumbent posture is about to be assumed, rather than previous to the active business of the day. When they are prolapsed they must be returned by gentle pressure; and for the arrest of hæmorrhage we must rely on replacement within the

anal orifice; the maintainance of the horizontal posture, and the injection of cold water, containing, perhaps, a few grains of Nitrate of Silver. In this hæmorrhage the usual remedies for bleeding from other parts—as Turpentine, Acetate of Lead, Tannic Acid, &c., have no influence.

Of operative measures the ligature is now generally preferred to the knife, and, although inflammation sometimes follows its application, still the experience of Curling, Ashton, Quain, Syme, and others, announces it to be the correct method. The latter author states, "it may be used without the slightest risk of serious inconvenience."

I do not, however, consider the ligature so applicable to the disease as it exists in this country, and for the following reasons: 1st. There is more risk of inflammation and tetanus, from supervention of which latter affection fatal cases have occurred; 2dly. Because change of climate will often remove the disease. Perhaps the application of Nitric Acid, as recommended by Mr. Henry Smith,* may be found more adapted to this disease in India.

On the whole, however, I do not recommend any kind of operative interference as a rule. Mr. Hancock has expressed his opinion, that many cases of piles might be relieved without any operation whatever, by paying attention to the system generally. This opinion was endorsed by Mr. Weeden Cooke, Dr. Willshire, Dr. Chowne, and Mr. Harding;† while M. Lisfranc observes, "I am convinced, the surgeon who cures without having recourse to the knife is far more useful than the most brilliant operator."

If due regulation of the bowels, attention to diet, and the use of remedies of reputed specific efficacy, as Conf. of Black Pepper, Cubebs, Pitch, Sulphur, &c., together with Zinc, Iron, or Alum Lotions, Hel-

* 'Lancet,' Oct. 30, 1858.
† Ibid., "Debate of Lond. Med. Society."

lebore, or Oxide of Mercury Ointments, &c., topically, do not cure, I advise the methodical application of pressure. This may be effected by the T shaped bandage and ivory bougie, or by the wax bougie. A fold of linen also placed on the chair, and employed, at all times, for external pressure, will be found a useful addition to the treatment. This is recommended by Mr. Skey, who also states, "they," hæmorrhoids, "are almost always amenable to well-directed pressure."

On these measures failing, change of climate, if possible, should be effected; and not until such means have been tried, and change of climate recommended, would I willingly subject the patient to the risk attendant on the ligature, knife, or other operative measures. Of course, if change of climate cannot be conveniently effected in any particular case which demands operation, the latter is to be performed.

Section IX.—On some Affections supposed to be caused by the Moon.

CHAPTER I.

NYCTALOPIA AND HEMERALOPIA.

The former signifying blindness during the day, and vision by night, is occasionally met with in the tropics, and follows sleeping in the rays of the moon, particularly on the deck of a vessel at sea. It is quite different from the photophobia, or aversion to light, as exemplified in the albino, or in scrofulous ophthalmia; and no altered condition or increased

sensitiveness can be detected in the eye itself. It is also unattended with pain, and may remain from a few days to months.

Hemeralopia or night blindness is also seen in the tropics, and appears to arise under the same circumstances. It also exists without any appreciable change in the internal eye.

Both these affections are occasionally feigned, and the diagnosis is extremely difficult when this is the case, and only to be arrived at correctly, by observing the patient when he supposes himself to be unwatched. Both have also been known to occur epidemically, and an instance is related, where sixty men in one ship were affected. Natives are more subject to be attacked than Europeans.

Causes. — It appears certain that the brilliant moonlight of the tropics is the exciting cause. Probably the optic nerve, from previous stimulation by the heat and glare of the day, is rendered more liable to be affected if exposed to the lunar rays. The ophthalmoscope may throw some light on these obscure conditions.

Treatment.—The treatment consists in attention to the general health, blisters behind the ear, and, what is still more important, confinement during the day in a perfectly darkened room. I have found the latter plan perfectly successful in cases of night blindness.

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